	KS1		LKS2		UKS2	
NC Statements	**Ask simple questions and recognising that they can be answered in different ways**		**Ask relevant questions and using different types of scientific enquiries to answer them**		**Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**	
Asking questions and answering them in different ways	**Year 1** Ask simple questions about what they notice about the world around them and demonstrate curiosity through these Children are shown how to use resources provided to answer different types of questions, helping them to recognise that there are different ways that questions can be answered	**Year 2** Ask logical questions based on or linked to things they have observed With help / scaffolds, begin to ask questions such as 'What will happen if…?" Children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered	**Year 3** Begin to consider prior knowledge when suggesting relevant questions about what they observe and about the world around them. Within a group suggest questions that can be explored, observed or investigated further Ask questions such as 'What if we tried….? or 'What if we changed…?' Begin to understand that some questions can be tested in the classroom and some cannot. Understand that there are 5 types of scientific enquiry that can be used to answer questions. As a group, begin to make some decisions about the best way of answering their questions.	**Year 4** Ask/raise their own relevant questions, considering prior knowledge, with increasing confidence and independence that can be explored, observed or investigated further Ask questions such as 'What will happen if…?" or 'What if we changed…? Select a relevant question that can be answered Understand that there are 5 types of enquiry and start to make their own decisions about the most appropriate type of enquiry they might use to answer scientific questions Given a range of resources, start making decisions for themselves on how to gather evidence to answer the question Recognise when secondary sources can be used to answer questions that cannot be answered through practical work	**Year 5** Refine a scientific question so that it can be tested e.g. 'What would happen to… if we changed…?' Independently ask their own scientific questions and take some ownership for finding out the answers to these Recognise scientific questions that do not yet have definitive answers Decide the type of enquiry needed to answer their questions and begin to justify their choices Given a range of resources the children decide for themselves how to gather evidence to answer a scientific question	**Year 6** Refine a scientific question to make it testable Ask a testable question which includes the change and measure variables - *e.g. what would happen to … if we changed …?* Independently ask a variety of scientific questions and take ownership for finding out the answers to these Recognise scientific questions that do not yet have definitive answers Use observations to suggest a further (testable or research) question. Decide the type of enquiry needed to answer their questions and justify their choice Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question

	KS1		LKS2		UKS2	
NC Statements	**Observe closely, using simple equipment**		**Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers**		**Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate**	
Making observations and taking measurements	**Year 1** Observe closely and communicate changes over time and the features or properties of things in the real world Observe closely using their senses Observe closely, using simple equipment (e.g. hand lenses, egg timers) Measure using non-standard units e.g. how many lolly sticks/cubes/handfuls, etc.	**Year 2** Observe and describe simple processes/cycles/changes with several steps Observe closely and communicate with increasing accuracy the features or properties of things in the real world Begin to make decisions about which equipment to use Measure using non-standard and simple standard measures (e.g. cm, time) with increasing accuracy Correctly and safely use equipment provided to make observations and/or take simple measurements	**Year 3** Observe and record relationships between structure and function Observe and record changes over time Observe things in the local environment / real contexts and record observations 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. Make simple accurate measurements using whole number standard units, using a range of equipment Use equipment accurately to improve the detail of their measurements and observations *(e.g. measuring syringes, measuring cylinders, microscopes, magnifying glasses)* Collect data from their own measurements using simple tables/standard units	**Year 4** Discuss ideas and develop descriptions from their observations using relevant scientific vocabulary Observe and record relationships between structure and function or between different parts of processes Observe and record changes over time 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. Recognise obvious risks and how to keep themselves and others safe Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment and scales Learn how to use new equipment, such as data loggers & measure temperature in degrees Celsius (°C) using a thermometer Collect data from their own observations and measurements, using notes/simple tables/standard units	**Year 5** Use their developing scientific knowledge and understanding and relevant scientific language and terminology to discuss, communicate and explain their observations 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 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). Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / units Identify possible risks to themselves and others and suggest ways of reducing these Choose the most appropriate equipment to use to collect data	**Year 6** Use correct scientific knowledge and understanding and relevant scientific language to discuss their observations Identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the world Explore more abstract systems / functions /changes / behaviours and record their understanding of these Make their own decisions about what measurements to take (and begin to identify the ranges used) Decide whether to repeat any readings and justify the reason for doing so Make, and act on, suggestions to control/reduce risks to themselves and others Use equipment fit for purpose to take measurements which are increasingly accurate and precise Decide the most appropriate equipment to use to collect data

	KS1		LKS2		UKS2	
NC Statements	**Perform simple tests** **Identify and classify**		**Set up simple practical enquiries, comparative and fair tests** **Gather, record, classify and present data in a variety of ways to help in answering questions**		**Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** **Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**	
Making predictions	**Year 1** With support, make a simple prediction or suggestion about what might happen	**Year 2** Make a simple prediction about what might happen and start to think about a reason	**Year 3** Make a prediction based on everyday experience and give a reason	**Year 4** Make a prediction based on the knowledge acquired from previous explorations /observations and apply it to a new situation	**Year 5** Give more than one possible prediction and begin to suggest which is the most likely. Justify their reason with some knowledge and understanding of the concept	**Year 6** 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
Planning practical enquiries	As a group, discuss ways of setting up a test	Discuss practical ways to find answers to their questions	As a group, begin to make some decisions about the best way of answering their questions.	Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions Explain their planning decisions and choices	Make most of the planning decisions for an investigation and explain these Decide the type of enquiry needed to answer their questions and begin to justify their choices	Independently plan investigations and explain planning decisions Decide the type of enquiry needed to answer their questions and justify their choice
Comparative and fair tests	With help, carry out a simple test/comparative test Begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a selection	Carry out simple comparative tests as part of a group, following a method with some independence With support, make suggestions on a method for setting up a simple comparative test	Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair. With support/as a group, set up simple practical enquiries incl. comparative and fair tests e.g. make a choice from a list of a things (variables) to change when conducting a fair test.	Carry out simple comparative and fair tests with increasing confidence investigating the effect of something on something else Begin to recognise when a fair test is necessary. Make some of the planning decisions about what to change and measure/observe.	Carry our fair/comparative tests with increasing independence With support/as a group, identify variables to change (independent variable), measure (dependent variable) and keep the same (controlled variable) in order for a test to be fair Recognise when it is appropriate to carry out a fair test.	Independently carry out fair/comparative tests Identify variables to change (independent variable), measure (dependent variable) and keep the same (controlled variable) in order for a test to be fair Decide when it is appropriate to carry out a fair test investigation, comparative test or alternative.
Identifying and classifying	Name/identify common examples and some common features With help, decide how to sort and group objects, materials or living things Name basic features of objects, materials and living things Compare and contrast simple observable	Name / identify common examples, some common features or different uses Sort and group objects, materials or living things by observable and/or behavioural features, identifying their own criteria for sorting. Compare and contrast a variety of things (objects, materials or living things) -	Find/suggest a practical way to compare things *e.g. rocks, magnets*. Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics Compare and contrast and begin to consider the relationships between different things	Use guides or simple keys to classify / identify (animals, flowering plants and non-flowering plants). 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 Begin to give reasons for these similarities and differences.	Compare and contrast things beyond their locality and use these similarities and differences to help to classify Suggest reasons for similarities and differences Use secondary sources of information to identify and classify. Decide which sources of information (and/or equipment	Recognise the importance of classification to the scientific world and form a conclusion from their sorting and classifying Compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction) Construct a classification key / branching database using more than two items

	features / characteristics of objects, materials and living things	focusing on the similarities as well as the differences	Record similarities as well as differences		and/or test) to help identify and classify	Compare and contrast things beyond their locality and discuss advantages/ disadvantages of the similarities and differences Use research to identify and classify things Use classification systems, keys and other information records (databases) to help classify or identify things.
Pattern Seeking	With support, begin to notice patterns	Begin to notice patterns and relationships	With support, begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them	Look for naturally occurring patterns and relationships and decide what data to collect to identify them	With support/as a group, identify patterns that might be found and collect and interpret own data to check for patterns	With increasing independence, identify patterns that might be found and collect and interpret own data to check for patterns
Research using secondary sources	Ask people questions (e.g. an expert) Use simple secondary sources to find things out	Make suggestions about who to ask or where to look for information. Ask people questions to help them answer their questions Use simple and appropriate secondary sources (such as books, photographs, videos and other technology) to find things out / find answers	Find things out using a range of secondary sources of information *(e.g. books, photographs, videos and other technology)*	Make decisions about which information to use from a wide range of sources and make decisions about how to present their research Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	Find out how scientific ideas have changed/developed over time Articulate and explain findings from their research using scientific knowledge and understanding Make decisions about which information to use from a wide range of sources	Research how scientific ideas have developed over time and had an impact on our lives Use evidence from a variety of sources to justify their ideas Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact Interview people to find out information

	KS1		LKS2		UKS2	
NC Statements	**Gather and record data to help in answering questions**		**Gather, record, classify and present data in a variety of ways to help in answering questions** **Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**		**Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**	
Recording data and presenting findings	**Year 1** Communicate their ideas to a range of audiences in a variety of ways Complete a pre-constructed table / chart using picture records or simple words Add annotations to drawings or photographs Begin to use some simple scientific language Record simple visual representations of observations made	**Year 2** Record and communicate their findings in a range of ways to a variety of audiences Use simple scientific language with increasing accuracy 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, pictograms, block graphs with 1:1 scale). - Sequence / annotate photographs of change over time - Produce increasingly detailed drawings which are labelled/annotated	**Year 3** Record and present findings in a variety of ways using simple scientific language and vocabulary including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), keys and presentations With scaffold / support record, and present data in a variety of ways to help in answering questions Record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Communicate their findings in ways that are appropriate for different audiences	**Year 4** Record findings using relevant scientific language and vocabulary including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts (where intervals and ranges agreed through discussion), keys and presentations Begin to select the most useful ways to collect, record, classify and present data from a range of choices Record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Make decisions on how best to communicate their findings in ways that are appropriate for different audiences	**Year 5** Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, scatter, bar and line graphs and models Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Make decisions about the most appropriate way of recording data	**Year 6** Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, scatter, bar and line graphs, and models. Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Make decisions about how to present and explain their findings through talk, in written forms or in other ways (e.g. using technology)

	KS1		LKS2		UKS2	
NC Statements	**Use their observations and ideas to suggest answers to questions**		**Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** **Use results to draw simple conclusions** **Identify differences, similarities or changes related to simple scientific ideas and processes** **Use straightforward scientific evidence to answer questions or to support their findings**		**Report and present 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** **Identify scientific evidence that has been used to support or refute ideas or arguments**	
Making conclusions	**Year 1** Use their recordings to talk about and describe what happened Sequence photographs of an event/observation With support, use their observations to suggest answers to questions Begin to use simple scientific language to talk about what they have found out or why something happened	**Year 2** With guidance, begin to notice patterns in their data e.g. order their findings, sequence best to worst, say what happened over time, etc. Recognise if results matched predictions. Use their recordings to talk about and describe what has happened Begin to use simple scientific language to explain what they have found out in relation to the question Give a simple, logical reason why something happened *(e.g. I think … because …)*	**Year 3** With scaffold/support, describe and compare the effect of different factors on something. *(e.g. we noticed that larger magnets are not always stronger)* With help, look for changes and simple patterns in their observations, data, chart or graph. Use their results to consider whether they met their predictions Use their experience and some evidence or results to draw a simple conclusion to answer their original question Write a simple explanation of why things happened (using the word 'because') and using simple scientific language and vocabulary	**Year 4** 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)* 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)* Begin to develop their ideas about relationships and interactions between things and explain them Use relevant scientific language and vocabulary to begin to say/explain *why* something happened	**Year 5** Describe straightforward patterns in results linking cause and effect e.g. using er…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)* Look for / notice relationships between things and begin to describe these. Comment on the results and whether they support the initial prediction Use their scientific knowledge and understanding and appropriate scientific language and terminology to explain their findings and data and answer their initial question Draw a valid conclusion (explain *why* it happened) based on their data and observations	**Year 6** Spot unexpected results that do not fit the pattern (anomalies) Identify patterns in results collected and describe them using the independent and dependent variables (causal relationships) (e.g. as we *increased the number of batteries* the *brightness the bulb increased* Identify evidence that refutes or supports their ideas Independently form a conclusion which draws on the evidence from the test Use scientific language and terminology to explain why something happened

	KS1		LKS2		UKS2	
NC Statements			**Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**		**Use test results to make predictions to set up further comparative and fair tests** **Report and present 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**	
Evaluating and raising further questions/ predictions	**Year 1**	**Year 2** Begin to discuss if a test was unfair.	**Year 3** Say whether what happened was what they expected and notice any results that seem odd Begin to recognise when a test is not fair and suggest improvements Begin to use results to raise further questions	**Year 4** Use results to suggest improvements, new questions and/or predictions for setting up further tests Compare their results with others and give reasons why results might be different	**Year 5** Begin to recognise how repeated readings improve the reliability of results Compare results with others and comment on how reliable they are With guidance, evaluate the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. Use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.	**Year 6** Be able to suggest reasons for unexpected results (anomalies) Evaluate the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. Describe how to improve planning to produce more reliable results Say how confident they are that their results are reliable and give a reason, identifying any limitations that reduce the trust they have in their data

	KS1	LKS2	UKS2
Vocabulary	questions answers equipment gather measure record results pictogram tally chart block diagram Venn diagram table chart sort group test explore observe compare describe similar/similarities different/differences order observe changes over time notice patterns link secondary sources hand lenses egg timers stopwatch ruler tape measure metre stick beaker pipette syringe	**Previous vocab plus**: types of scientific enquiry increase decrease identify classify comparative tests fair tests careful accurate observations present data evidence results keys bar charts conclusions prediction support/not support thermometers data loggers magnifying glass microscope	**Previous vocabulary plus** opinion/fact variables independent variable dependent variable controlled variable accuracy precision degree of trust classification keys scatter graphs line graphs causal relationship support/refute