Working Scientifically – Progression of Skills for **Classification**

	To ask scientific questions	To plan an enquiry	To make a prediction	To observe closely	To measure precisely / accurately	To gather / record results	To present results	To interpret results	To draw conclusions	To evaluate an enquiry
Key Stage One *Developing close observation*	Be able to ask a yes/no questions to aid sorting	Identify the headings for the two groups (it is …., it is not….)		Be able to compare objects based on obvious, observable features e.g. size, shape, colour, texture etc.			Sort objects and living things into two group using a basic Venn diagram or simple table	Talk about the number of objects in each group i.e. which has more or less	Children in KS1 are not expected to draw conclusions. They are expected to make observations which will help them to answer questions. They do not have the subject knowledge to give reasons for what they observe so they cannot draw scientific conclusions.	
Lower Key Stage Two *Developing a systematic approach*	Be able to ask a range of yes/no questions to aid sorting	Be able to put appropriate headings onto intersecting Venn and Carroll diagrams		Be able to compare objects based on more sophisticated, observable features. Present observations in labelled diagrams			Sort objects and living things into groups using intersecting Venn and Carroll diagrams	Spot patterns in the data particularly two criteria with no examples e.g. there are no living things with wings and no legs	Draw simple conclusions when appropriate for patterns e.g. a flying insect with no legs might always crash land	Suggest improvement e.g. a wider range of objects – only looked a British trees. Suggest new questions arising from the investigation.
Upper Key Stage Two *Developing independence*	Be able to ask a range of yes/no questions to aid sorting and decide which ways of sorting will give useful information	Identify specific clear questions that will help to sort without ambiguity		Be able to compare not only based on physical properties but also on knowledge gained through previous enquiry			Create branching databases (tree diagrams) and keys to enable others to name livings things and objects	Be able to talk about the features that objects and living things share and do not share based on the information in the key etc	Be able to use data to show that livings things and materials that are grouped together have more things in common than with things in other groups	Be able to explain using evidence that the branching database or classification key will only work for the living things or materials it was created for

Working Scientifically – Progression of Skills for **Research**										
	To ask scientific questions	**To plan an enquiry**	**To make a prediction**	**To observe closely**	**To measure precisely / accurately**	**To gather/record results**	**To present results**	**To interpret results**	**To draw conclusions**	**To evaluate an enquiry**
Key Stage One ***Developing close observation***	Ask one or two simple questions linked to a topic						Present what they have learnt verbally or using pictures	Be able to answer their questions using in simple sentences		
Lower Key Stage Two ***Developing a systematic approach***	Ask a range of questions linked to a topic	Choose a source from a range provided					Present what they learnt verbally or using labelled diagrams	Be able to answer their questions using simple scientific language		Suggest limitations e.g. only had one book. Suggest new questions arising from the investigation.
Upper Key Stage Two ***Developing independence***	Ask a range of questions recognising that some can be answered through research and others may not	Choose suitable sources to use					Present what they learnt in a range of ways e.g. different graphic organisers	Be able to answer their questions using scientific evidence gained from a range of sources		Be able to talk their degree of trust in the sources they used

Working Scientifically – Progression of Skills for **Comparative / Fair Tests**										
	To ask scientific questions	**To plan an enquiry**	**To make a prediction**	**To observe closely**	**To measure precisely / accurately**	**To gather/record results**	**To present results**	**To interpret results**	**To draw conclusions**	**To evaluate an enquiry**
Key Stage One *Developing close observation*	Identify the question to investigate from a scenario or choose a question from a range provided	Choose equipment to use, decide what to do and what to observe or measure in order to answer the question	Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen but this will be based on experience or may simply be a guess.	Make observations linked to answering the question	When appropriate, measure using standard units where all the numbers are marked on the scale	Record data in simple prepared tables, pictorially or by taking photographs	Present what they learnt verbally, using pictures or block diagrams	Answer their question in simple sentences using their observations or measurements		
Lower Key Stage Two *Developing a systematic approach*	Ask a range of relevant questions linked to a topic	Decide what to change and what to measure or observe	Use results from an investigation to make a prediction about a further result	As for KS1	Measure using standard units where not all the numbers are marked on the scale, take repeat readings where necessary	Prepare own tables to record data	Present data in bar charts	Refer directly to their evidence when answering their question	Where appropriate provide oral or written explanations for their findings	Suggest improvements e.g. to method of taking measurements. Suggest new questions arising from the investigation.
Upper Key Stage Two *Developing independence*	Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results	Recognise and control variables where necessary.	Use test results to make predictions for further investigations	As for KS1	Measure using standard units using equipment that has scales involving decimals	Prepare own tables to record data, including columns for taking repeat readings	Choose an appropriate form of presentation including line graphs	Be able to answer their question, describing causal relationships	Provide oral or written explanations for their findings	Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled and accuracy of results

Working Scientifically – Progression of Skills for **Observation over time**										
	To ask scientific questions	**To plan an enquiry**	**To make a prediction**	**To observe closely**	**To measure precisely / accurately**	**To gather/record results**	**To present results**	**To interpret results**	**To draw conclusions**	**To evaluate an enquiry**
Key Stage One *Developing close observation*	Ask a question about what might happen in the future based on an observation	Choose equipment to use, decide what to do and what to observe or measure in order to answer the question	Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen but this will be based on experience or may simply be a guess.	Make observations linked to answering the question	When appropriate, measure using standard units where all the numbers are marked on the scale	Record data in simple prepared tables, pictorially or by taking photographs	Present what they learnt verbally or using pictures	Answer their question in simple sentences using their observations or measurements		
Lower Key Stage Two *Developing a systematic approach*	Ask a range of relevant questions linked to a topic	Decide what to measure or observe. Decide how often to take a measurement	Use results from an investigation to make a prediction about a further result	Make a range of relevant observations linked to answering the question	Measure using standard units where not all the numbers are marked on the scale. Use dataloggers to measure over time	Prepare own tables to record data	Present data in time graphs	Refer directly to their evidence when answering their question	Where appropriate provide oral or written explanations for their findings	Suggest improvements e.g. need to make observations more regularly. Suggest new questions arising from the investigation.
Upper Key Stage Two *Developing independence*	Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results	Recognise and control variables where necessary	Use test results to make predictions for further investigations	Make a range of relevant observations linked to answering the question	Measure using standard units using equipment that has scales involving decimals	As for LKS2	Choose an appropriate form of presentation including line graphs	Be able to answer their questions, describing the change over time	Provide oral or written explanations for their findings	Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled and accuracy of results

Working Scientifically – Progression of Skills for **Pattern Seeking**										
	To ask scientific questions	**To plan an enquiry**	**To make a prediction**	**To observe closely**	**To measure precisely / accurately**	**To gather/record results**	**To present results**	**To interpret results**	**To draw conclusions**	**To evaluate an enquiry**
Key Stage One *Developing close observation*	Ask a question that is looking for a pattern based on observations	Choose equipment to use, decide what to do and what to observe or measure in order to answer the question	Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen but this will be based on experience or may simply be a guess.	Make observations linked to answering the question	When appropriate, measure using standard units where all the numbers are marked on the scale	Record data in simple, prepared tables and tally charts	Present what they learnt verbally	Answer their question in simple sentences using their observations or measurements		
Lower Key Stage Two *Developing a systematic approach*	Ask a range of relevant questions linked to a topic	Decide what to measure or observe	Use results from an investigation to make a prediction about a further result	As for KS1	Measure using standard units where not all the numbers are marked on the scale.	Prepare own tables to record data	Use ICT package to present data as a scattergram	Refer directly to their evidence when answering their question	Where appropriate provide oral or written explanations for their findings	Suggest improvements e.g. needed a bigger sample/wider range. Suggest new questions arising from the investigation.
Upper Key Stage Two *Developing independence*	Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results	Recognise and control variables where necessary	Use test results to make predictions for further investigations	As for KS1	Measure using standard units using equipment that has scales involving decimals	As for LKS2	Choose an appropriate form of presentation including scatter graphs	Be able to answer their questions identifying patterns	Provide oral or written explanations for their findings	Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled and accuracy of results

Working Scientifically – Progression of **Vocabulary**			
EYFS and Year 1	**Year 2** *(plus previous year group)*	**Lower KS2** *(plus previous year groups)*	**Upper KS2** *(plus previous year groups)*
Questions Answers Equipment Gather Measure Record Results Sort Group Test Explore Observe Compare Describe Similar/similarities Different/differences Egg timers Ruler Tape measure Metre stick Beaker Pipette syringe	Pictogram Tally chart Block diagram Venn diagram Table Chart Order Observe changes over time Notice patterns Link Secondary sources Hand lenses Stop watch	Variables Control variable Types of scientific enquiry Identify Classify Order/rank Comparative tests Fair tests Careful/systematic Accurate Observations Evidence Present Data/evidence/results Keys Bar charts Conclusions Prediction Support/not support/ refute Thermometers Data loggers Magnifying glass Microscope Increase Decrease Appearance	Independent variable Dependent variable Accuracy Precision Degree of trust Classification keys Scatter graphs Line graphs Causal relationship Opinion/fact