Science: Progression in Disciplinary knowledge

During the course of our science curriculum, our children will develop the following disciplinary knowledge:

	Science skill		Science skill
 1	Asking scientific questions	 2	Presenting results
 3	Planning an enquiry	 4	Interpreting results
 5	Observing closely	 6	Drawing conclusions (KS2 only)
 7	Taking measurements	 8	Making predictions (KS2 only)
 9	Gathering and recording results	 10	Evaluating an enquiry (KS2 only)

EYFS	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classifying	Be able to ask a Yes/No question to aid sorting	Identify the headings for the two groups	Know about similarities and differences in relation to places, objects, materials and living things			Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories	Talk about the number of objects in each group i.e. which has more or less	Children in EYFS are not expected to draw conclusions. They are expected to make observations which will help them to answer questions.	Children in EYFS 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.	Children in EYFS are not expected to evaluate.
Researching	Ask one or two simple questions linked to a topic						Be able to answer their questions using simple sentences			
Comparative/fair testing		Choose the resources they need for their chosen activities and say when they do or don't need help	Make observations linked to answering the question		Record data in simple prepared tables, pictorially or by taking photographs		Answer their question in simple sentences using their observations or measurements			
Observing over time	Ask a question about what might happen in the future based on an observation		Make observations of animals and plants				Explain why some things occur and talk about changes			
Pattern seeking	Ask a question that is looking for a pattern based on observations				Record data in simple, prepared tables and tally charts					

KS1	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classifying	Be able to ask a Yes/No question 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.	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.	Children in KS1 are not expected to evaluate. However, children should be encouraged to consider their method and adapt this where necessary.
Researching	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 simple sentences			
Comparative/fair testing	Identify the question to investigate from a scenario or choose a question from a range provided	Choose equipment to use and decide what to do and what to observe or measure in order to answer the question	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			
Observing over time	Ask a question about what might happen in the future based on an observation		Observe closely, using simple equipment			Present what they learnt verbally or using pictures				
Pattern seeking	Ask a question that is looking for a pattern based on observations				Record data in simple, prepared tables and tally charts	Present what they learnt verbally				

LKS2	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classifying	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 at British trees. Suggest new questions arising from the investigation.
Researching	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.
Comparative/fair testing		Decide what to change and what to measure or observe	Make a range of relevant observations	Measure using standard units where not all the numbers are marked on the scale.	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	Use results from an investigation to make a prediction about a further result	Suggest improvements e.g. to method of taking measurements. Suggest new questions arising from the investigation.
Observing over time		Decide what to measure or observe. Decide how often to take a measurement.		Measure using standard units where not all the numbers are marked on the scale. Use dataloggers to measure over time.		Present data in time graphs				
Pattern seeking		Decide what to measure or observe	Make observations linked to answering the question	Measure using standard units where not all the numbers are marked on the scale.		Use ICT package to present data as a scatter gram				

UKS2	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classifying	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
Researching	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 about their degree of trust in the sources they used
Comparative/fair testing	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	Make a range of relevant observations Make observations linked to answering the question	Measure using standard units using equipment that has scales involving decimals and take repeat readings where necessary	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	Use test results to make predictions for further investigations	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
Observing over time							Be able to answer their questions, describing the change over time			
Pattern seeking						Choose an appropriate form of presentation, including scatter graphs	Be able to answer their questions identifying patterns			