Disciplinary Knowledge – Skills

At Edenham, the working scientifically statements found within the National Curriculum have been grouped under the following broader skills definitions:
- Asking questions and recognising that they can be answered in different ways
- Making observations and taking measurements
- Engaging in practical enquiry to answer questions
- Recording and presenting evidence
- Answering questions and concluding
- Evaluating and raising further questions and predictions
- Communicating their findings.

For EYFS, statements that have come from the Development Matters document, that relate to working scientifically, have been grouped together based on the working scientifically skills definitions that are used (see above).

EYFS	
Show curiosity and ask questions (Links with asking questions and recognising that they can be answered in different ways)	Ask questions to find out more and to check they understand what has been said to them. (Communication and language) • While playing and exploring, the children ask 'I wonder…' questions. • With support, the children develop their ideas for answering their questions.
Make observations using their senses and simple equipment **Make direct comparisons** **Identify, sort and group** (Links with making observations and taking measurements and engaging in practical enquiry to answer questions)	E xplore the natural world around them. (Understanding the world) Describe what they see, hear and feel whilst outside. (Understanding the world) Develop their small motor skills so that they can use a range of tools competently, safely and confidently. (Physical development) Count objects, actions and sounds. (Mathematics) Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. (Communication and language) Show resilience and perseverance in the face of challenges. (Personal, social and emotional development) • Explore the natural and made world using their senses. • The children use magnifying glasses or tablets with magnifiers to make observations. • The children use smaller pieces of equipment such as syringes and pipettes. • With support, make comparisons, using hands and feet and other non-standard measures e.g. building blocks and beakers. • While playing and exploring, the children, try out using resources to answer a question. The children test things out to make comparisons e.g. Does the red car go further than the blue car? • They identify and name objects by matching them with pictures. • The children sort and group objects, sometimes using their own criteria.
Record their observations by drawing, taking photographs,	Connect one idea or action to another using a range of connectives. (Communication and language) Describe events in some detail (Communication and language)

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using sorting rings or boxes and on simple tick sheets (Links with recording and presenting evidence)	• The children, sometimes, draw and write simple labels to record their observations. • With support, they record their observations and comparisons e.g. using simple prepared tables, taking photographs, using sorting rings and boxes.
Use their observations to help them to answer their questions (Links with answering questions and concluding)	Listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary. (Communication and language) Connect one idea or action to another using a range of connectives. (Communication and language) Describe events in some detail. (Communication and language) Compare length, weight and capacity. (Mathematics) • The children talk about what they have observed. • The children demonstrate and talk about what they have found out. • They, sometimes, talk about what they have found out from secondary sources, including non-fiction texts. • The children notice and talk about how they made a difference to an outcome e.g. "My car went further when I pushed it harder." • The children make direct comparisons or use their recorded observations to communicate what they have found out and answer the question, where appropriate.

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 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	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	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, in sentences, or using pictures	Be able to answer their questions using simple sentences			

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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	give reasons for what they observe so they cannot draw scientific conclusions.	based on experience or may simply be a guess.	
Observing over time	Ask a question about what might happen in the future based on an observation				Record data in simple prepared tables, pictorially or by taking photographs	Present what they learnt verbally, in sentences, 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 or in sentences.				

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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, writing, 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	As for KS1	Measure using standard units where not all the numbers are marked on the scale, and 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	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

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Observing over time		Decide what to measure or observe. Decide how often to take a measurement.	Make a range of relevant observations	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				from the investigation.
Pattern seeking		Decide what to measure or observe	As for KS1	Measure using standard units where not all the numbers are marked on the scale.		Use ICT package to present data as a scattergram				

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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 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	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	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					As for LKS2		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			