Cam Woodfield Junior School Working Scientifically Expectations overview for each stage of an investigation

Working Scientifically stages for all five areas:

Pattern seeking Observing Research Identifying, Classifying and grouping Comparative and Fair Testing

	EYFS	KS1	Lower KS2	Upper KS2	Working above KS2
PLAN	Choose the resources they need for their chosen activities and say when they do or don't need help.	Ask simple questions and recognise that they can be answered in different ways 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	Ask relevant questions and use different types of scientific enquiries to answer them Set up simple practical enquiries, comparative and fair tests Given a range of resources, the children decide for themselves how to gather evidence to answer the question Identify the enquiry focus that they have chosen to answer their question. Make predictions based upon prior knowledge.	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Select a range of practical resources to gather evidence to answer their question Use test results to make predictions to set up further comparative and fair tests Decide what observations or measurements to make over time and for how long Select measuring equipment to give the most precise results. Make predictions using scientific knowledge and understanding	Ask questions and develop a line of enquiry based on observations of the real world alongside prior knowledge and experience Make predictions using scientific knowledge and understanding Select and plan the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables.

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	ACT	Know about similarities and differences in relation to places, objects, materials and living things. Make observations of animals and plants Explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	Observe closely, using simple equipment Perform simple tests Identify and classify Begin to take measurements, initially by comparisons, then using non-standard units Use practical resources provided to gather evidence to answer questions	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Follow their plan to carry out the specific enquiry skill.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).	Select, plan and carry out the most appropriate types of scientific enquiries to test predictions. Use appropriate techniques, apparatus and materials during fieldwork and laboratory work, paying attention to health and safety. Make and record observations and measurements using a range of methods for different investigations.
			<u>Maths Y1 objectives:</u> N/A- see Y2 <u>Maths Y2 objectives:</u> Construct a tally chart Interpret and construct a pictogram where the symbols represent a single item, 2 items, 5 or 10 items. Interpret and construct a block diagram	<u>Maths Y3 objectives:</u> Create a table to show data. Interpret and construct a pictogram where the symbol represents multiple items <u>Maths Y4 objectives:</u> See Y3 objectives for creating a table, and Y4 Science objectives.	<u>Maths Y5 objectives:</u> See previous year group objectives and Science objectives <u>Maths Y6 objectives:</u> See previous year group objectives and Science objectives	

RECORD	Represent their own ideas, thoughts and feelings through role play, music, dance, art, technology and stories.	Gather and record data to help in answering questions Classify using simple prepared tables and sorting rings	Gather, record, classify and present data in a variety of ways to help in answering questions, sometimes from their own decision Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Interpret their data to generate simple comparative statements based on their evidence. Begin to find patterns and causal relationships	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, Decide how to record and present evidence for the enquiry type. Present the same data in different ways.	Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements Present observations and data using appropriate methods, including tables and graphs Apply mathematical concepts and calculate results.
		Maths Y1 objectives: N/A – see Y2 Maths Y2 objectives: Interpret a table See also Act objectives.	Maths Y3 objectives: Interpret data in a table Interpret and construct a bar chart Maths Y4 objectives: Interpret bar charts with different scales on the frequency axis Construct a bar chart with different scales on the frequency axis Interpret a time graph Construct a time graph	Maths Y5 objectives: Read and interpret information given in a table Read and interpret information given in a line graph Maths Y6 objectives: Interpret and construct line graphs Interpret and pie charts by measuring angles Understand the meaning of 'average' and calculate the mean of a set of discrete data Interpret the mean of a set of discrete data	

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	EVALUATE	Talk about the features of their own immediate environment and how environments might vary from one another Explain why some things occur, and talk about changes	Use their observations and ideas to suggest answers to questions Recognise 'biggest and smallest', 'best and worst' etc. from their data	Report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions Answer their own and others' questions based on their recordings. Answers are consistent with the evidence Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support their findings Identify how they would do it differently if they repeated the enquiry	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 results, 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. Evaluate the choice of method used, the control of variables, the precision and credibility of secondary sources used. Identify any limitations that reduce the trust they have in their data. Use the scientific knowledge gained from enquiry work to make predictions they can further investigate.	Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions Present reasoned explanations, including data in relation to predictions and hypotheses Evaluate data, showing awareness of potential sources of error Identify further questions arising from results