Scargill C of E Primary School Working Scientifically Key Stage Progression Overview

Forming the basis of working scientifically at Scargill - 7 key science skills that children develop from ages 4-11

asking questions/making predictions/setting up tests/observing and measuring/recording data/interpreting and communicating results/evaluating

	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Working scientifically objectives for KS1, LKS2 and UKS2	Sc1/1.1 asking simple questions and recognising that they can be answered in different ways Sc1/1.2 observing closely, using simple equipment Sc1/1.3 performing simple tests Sc1/1.4 identifying and classifying Sc1/1.5 using their observations and ideas to suggest answers to questions Sc1/1.6 gathering and recording data to help in answering questions	Sc4/1.1 asking relevant questions and using different types of scientific enquiries to answer them Sc4/1.2 setting up simple practical enquiries, comparative and fair tests Sc4/1.3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Sc4/1.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Sc4/1.5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Sc5/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Sc5/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision Sc5/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs Sc5/1.4 using test results to make predictions to set up further comparative and fair tests Sc5/1.5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in

		Sc4/1.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Sc4/1.7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Sc4/1.8 identifying differences, similarities or changes related to simple scientific ideas and processes Sc4/1.9 using straightforward scientific evidence to answer questions or to support their findings.	oral and written forms such as displays and other presentations Sc5/1.6 identifying scientific evidence that has been used to support or refute ideas or arguments.
Revision from previous key stage		Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science Know that we can use magnifying glasses to observe objects closely Know that we can test our questions to see if they are true Know that objects can be identified or sorted into groups based on their observable properties Know that we can write down numbers and words or draw pictures to record what we find	Know that we can ask questions and answer them by setting up scientific enquiries Know how to make relevant predictions that will be tested in a scientific enquiry Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key

			how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table Know – with structured guidance – how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc)

			Know that they can draw conclusions from the findings of other scientists Know that a theory is an explanation of observations that have been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry
New learning	Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science Know that we can use magnifying glasses to observe objects closely Know that we can test our questions to see if they are true Know that objects can be identified or sorted into groups based on their observable properties Know that we can write down numbers and words or draw pictures to record what we find	Know that we can ask questions and answer them by setting up scientific enquiries Know how to make relevant predictions that will be tested in a scientific enquiry Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key; how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table	Know how to choose appropriate variables to test a hypothesis (e.g. plant height as a dependent variable when measuring effect of light on plant growth) Know how to identify conditions that were imperfectly controlled and can explain how these might affect results Know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device Know how and when to repeat measurements, how to find an average of a set of measurements and how to recognise and remove outliers from a set of data, justifying the removal as a potential mis-measurement Know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion

		Know how – with structured guidance – to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc) Know that they can draw conclusions from the findings of other scientists	Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary Know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g. fossil records as evidence of natural selection)

		Know that a theory is an explanation of observations that have been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry	