Castlechurch Primary School

Working Scientifically Skills Progression

This document shows how the working scientifically statements from the science National Curriculum for England are linked and built on from EYFS and across the three phases in Key Stage 1 and 2. To highlight the links, the working scientifically skills statements are 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

The working scientifically statements from the science National Curriculum for England are presented in bold.

Working scientifically statements that feature in more than one of the broader skills definitions are shown in blue.

In the EYFS, the characteristics of effective learning from the Statutory Framework for the Early Years Foundation Stage are the foundations on which the working scientifically skills build in Key Stage 1. While children are playing and exploring, teachers should be modelling, encouraging and supporting them to do the following: ·show curiosity and ask questions ·make observations using their senses and simple equipment ·make direct comparisons ·use equipment to measure ·record their observations by drawing,	**KS1 Science National Curriculum** During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions.	**LKS2 Science National Curriculum** During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	**UKS2 Science National Curriculum** During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific

taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets •use their observations to help them to answer their questions •talk about what they are doing and have found out •identify, sort and group.		• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments.

NB - The National Curriculum statements in blue in these tables indicate that they feature more than once.

	Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
Asking questions and recognising that they can be answered in different ways.	**Asking simple questions.** • While exploring the world, the children develop their ability to ask questions. • The children answer questions developed with the teacher through questioning in provision and adult led activities. • Discuss resources that helped us find answer enquiry questions.		**Asking simple questions and recognising that they can be answered in different ways.** • While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where		**Asking relevant questions and using different types of scientific enquiries to answer them.** • The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions.		**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.** • Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding	

		appropriate, they answer these questions. • The children answer questions developed with the teacher often through a scenario. • The children are 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.	• The children answer questions posed by the teacher. • Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.	following an enquiry. • Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
Making observations and taking Measurements.	**Observing closely.** • Children explore the world around them. They make simple observations to support similarities and differences • Have interactions with the outdoors to foster curiosity and give children freedom to touch, smell and hear the natural world around them during hands-on experiences. •Use appropriate equipment such as magnifying glasses and view finders.	**Observing closely, using simple Equipment.** • Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • They begin to take measurements, initially by comparisons, then using non-standard units.	**Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.** • The children make systematic and careful observations. • They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.** • The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • 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).
Engaging in practical enquiry to answer questions.	**Identifying and classifying** • Children use their observations to identify objects, materials and living things. They sort and group these things, when given a criteria. • They use simple descriptions for the characteristics they used to identify a living thing. • Children use simple equipment such as magnifying glasses to help them answer questions asked by the teacher and to make simple observations.	**Performing simple tests** • The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. Identifying and classifying. • Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. • They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	**Setting up simple practical enquiries, comparative and fair tests.** • The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. **Explanatory Note:** *A comparative test is performed by changing a variable that is qualitative eg: the type of material, shape of the parachute. This leads to a ranked outcome.* *A fair test is performed by changing a variable that is quantitive eg: the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.*	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.** • The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
Recording and presenting evidence.	**Gathering and recording data to help in answering questions.** • The children record their observations e.g. using photographs, videos, drawings or mark making/writing. • As a class they record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.	**Gathering and recording data to help in answering questions.** • The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.• They record their measurements e.g. using tables, pictograms, tally charts and block graphs.	**Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.** • The children sometimes decide how to record and	**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.** • The children decide how to record and present evidence. They record observations e.g. using annotated photographs,

	• They classify using simple sorting rings.	• They classify using simple tables and sorting rings.	present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. • Children are supported to present the same data in different ways in order to help with answering the question.	videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Children present the same data in different ways in order to help with answering the question.
Answering questions and concluding.	**Using their observations and ideas to suggest answers to questions.** • Children use their experiences of the world around them to suggest appropriate answers to questions. During adult led discussions they are supported to relate these to their evidence e.g. observations they have made or information they have gained from experience. **Using their observations and ideas to suggest answers to questions.** • With support from an adult, children begin to recognise patterns from their data.	**Using their observations and ideas to suggest answers to questions.** • Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. **Using their observations and ideas to suggest answers to questions.** • The children recognise patterns from their data.	**Using straightforward scientific evidence to answer questions or to support their findings.** • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. Identifying differences, similarities or changes related to simple scientific ideas and processes. • Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify	**Identifying scientific evidence that has been used to support or refute ideas or arguments.** • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to

			naturally occurring patterns and causal relationships. **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.** • They draw conclusions based on their evidence and current subject knowledge.	new evidence that they have gathered. • They talk about how new discoveries change scientific understanding. **Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.** • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
Evaluating and raising further questions and predictions.	Children make simple predictions from what they already know from experience.	Children make predictions from what they already know from experience. They explain why they think that.	**Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.** • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.	**Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.** • They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the

				credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data.