Benson Working Scientifically Skills Progression from Nursery to Year 6
Based on ASE PLAN and NC guidelines

The working scientifically skills outlined below are embedded throughout the topics taught in each year group. Teachers plan to cover a range of skills throughout each term and year so that children have the opportunity to revisit skills in order to develop competency.

This document includes how the Development Matters statements that relate to the working scientifically skills in the National Curriculum in England: science programmes of study, build across Nursery and Reception and are linked to the working scientifically statements for Key Stage 1. Mapping the PLAN EYFS working scientifically skills definitions to their Key Stage 1 and 2 equivalents.

The table below shows how the EYFS working scientifically skills definitions, which are based on the relevant statements in Development Matters, map to the equivalent definitions for Key Stage 1 & 2.

PLAN EYFS working scientifically skills definitions	PLAN Key Stage 1 & 2 working scientifically skills definitions
Show curiosity and ask questions	Asking questions and recognising that they can be answered in different ways
Make observations using their senses and simple equipment	Making observations and taking measurements
Make direct comparisons	
Identify, sort and group	Engaging in practical enquiry to answer questions
Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception, on simple tick sheets	Recording and presenting evidence
Talk about what they have done and found out	Answering questions and concluding
Use their observations to help them to answer their questions	

Progression in working scientifically skills from Nursery to Key Stage 1

The following tables expand on the mapping shown above by identifying the Development Matters statements from the different areas of learning for Nursery and Reception (shown in bold) that are linked to the PLAN EYFS working scientifically skills definitions. The bullet points that follow the Development Matters statements are additional guidance that illustrate their application in a science context. For Years 1 & 2, the working scientifically statements from the National Curriculum that link to the PLAN Key Stage 1 & 2 working scientifically skills definitions are shown in bold with their associated guidance. Together, these provide a progression in working scientifically skills from Nursery, through Reception, to Key Stage 1.

Enquiry types

These five types are experienced throughout each topic in each year:

Observing over Time, Fair (KS2) and Comparative testing, Pattern Seeking, Sorting and Classifying, Research.

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Nursery & Reception	Year 1&2	Year 3&4	Year 5&6
Asking questions and recognising that they can be answered in different ways			
Show curiosity and ask questions **<u>Nursery</u>** **Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"** (Communication and language) While playing and exploring, the children demonstrate their curiosity. While playing and exploring, the children begin to ask 'I wonder …' questions. With support, the children think of ideas for answering their questions. **<u>Reception</u>** **Ask questions to find out more and to check they**	**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 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.	**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. • 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.	**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 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.

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.			
Making observations and taking measurements			
Make observations using their senses and simple equipment **Make direct comparisons** **Identify, sort and group**	**Observing closely, using simple equipment** **Measure in standard units - a shift to quantitative ways.**	**Making systematic and careful observations and, where appropriate. Measuring more accurately using standard units, using a range of equipment, including thermometers and**	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate**

Measure in non-standard qualitative ways e.g., measure temperature with non-standard qualitative measures e.g., senses, measure time with egg timers. <u>**Nursery**</u> **Use all their senses in hands-on exploration of natural materials.** (Understanding the world) **Explore how things work.** (Understanding the world) **Use one-handed tools and equipment.** (Physical development) **Choose the right resources to carry out their own plan. For example, choosing a spade to enlarge a small hole they dug with a trowel**. (Physical development) Make comparisons between objects relating to size, length, weight and capacity. (Mathematics)	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 and introduced to and begin to use thermometers to measure temperature Measure length and height in whole cm. Measure temperature easy to read scales. Teach how to correctly use a thermometer. Measure volume with measuring cups/spoons/bottles with easy to read scales e.g, 100ml, 200ml, 300ml. Measure time to (hours, minutes, seconds)	**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. Measure length/height in whole mm **Measure volume** with equipment such as jugs with scales with divisions between whole numbers. **Measure temperature -** Measure accurate temperature with analogue scales to nearest degree. Measure temperature with digital reading to nearest tenth of degree.	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). Measure volume with accuracy to ml. Measure accurate temperature with analogue scales to nearest degree. Measure temperature accurately with digital reading to nearest tenth of degree.

Compare quantities using language: 'more than', 'fewer than'. (Mathematics) **Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen, or one which is suggested to them.** (Personal, social and emotional development) With support, explore the natural and made world using their senses. With support, the children use magnifying glasses or tablets with magnifiers to make observations. The children explore using beakers/scoops etc. Make comparisons between objects ("This leaf is bigger than that one.") and quantities ("There are more flowers on this one."). While playing and exploring, the children select and use resources for a particular task. • With support, the children sort and group objects.			

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<u>Reception</u> **Explore 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) **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 challenge.** (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.			
Engaging in practical enquiry to answer questions			
Make observations using their senses and simple equipment.	**Performing simple tests**	**Setting up simple practical enquiries, comparative and fair tests**	**Planning different types of scientific enquiries to answer questions,**

Make direct comparisons. Identify, sort and group. **<u>Nursery</u>** **Explore 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) **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 challenge.** (Personal, social and emotional development)	• 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.	• 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 e.g. 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 quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.	**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.

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.			
Recording data and observations and evidence			
<u>Science skills</u> **Record their observations by drawing, taking photographs, using sorting rings or boxes and, in Reception on simple tick sheets** **<u>Nursery</u>** **Talk about what they see, using a wide vocabulary.** (Understanding the world) **Create closed shapes with continuous lines, and begin to use these shapes to**	**<u>Science skills</u>** **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 prepared tables, pictograms, tally charts and block graphs. • They classify using simple prepared tables and sorting rings.	**<u>Science skills</u>** **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 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	**<u>Science skills</u>** **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, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using

represent objects. (Understanding the world) **Draw with increasing complexity and detail, such as representing a face with a circle and including details**. (Understanding the world) •With support, the children talk about what they have observed. • They sometimes draw and make marks to record their observations. • With support, they use sorting rings and boxes. **<u>Reception</u>** **Connect one idea or action to another using a range of connectives.** (Communication and language) **Describe events in some detail.** (Communication and language)		diagrams. Children are supported to present the same data in different ways in order to help with answering the question	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.

• 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.			
Answering questions and concluding			
Use their observations to help them to answer their questions **<u>Nursery</u>** Make comparisons between objects relating to size, length, weight and capacity. (Mathematics) Compare quantities using language: 'more than', 'fewer than'. (Mathematics) • With support, the children demonstrate and talk about what they have done and noticed. • With support, the children notice how they made a difference to an outcome, e.g. "My car went	**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 'biggest and smallest', 'best and worst' etc. 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 naturally occurring patterns and causal relationships.	**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

further when I pushed it harder.", and answer the question, where appropriate. • With support, the children make comparisons between objects e.g. "My plant is taller than Sarah's.". **Reception** **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		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	to 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.

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.			
Evaluating and raising further questions and prediction			
		Using results to draw simple conclusions,	**Reporting and presenting findings from enquiries, including conclusions, causal relationships and**

		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.	**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.
		Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	**Using test results to make predictions to set up further comparative and fair tests** • Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.
Communicating their findings			

		Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	**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 communicate their findings to an audience using relevant scientific language and illustrations.