

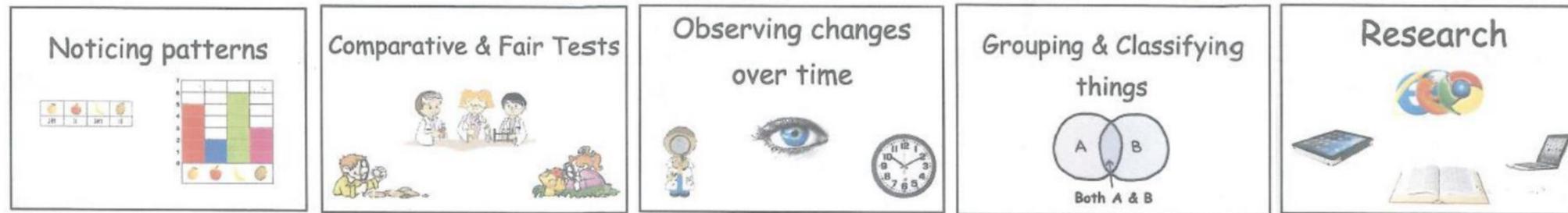


FROM THE NATIONAL CURRICULUM:

Working scientifically is the lifeblood of each and every area of science subject matter, and is what gives life and sustenance to learning new knowledge and developing understanding within Science. It is a large part of the science curriculum and is embedded throughout all the topics.

As no single topic that continues from EYFS to year 6, progression in science should be assessed through the knowledge gained in each subject and progression in the skills of working scientifically.

Some of the scientific skills studied at primary level include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources.



Pupils are also encouraged to seek answers to questions through collecting, analysing and presenting data, relating to their mathematics. Science should be seen as an opportunity to apply both literacy and maths objectives within a purposeful context (instructional, explanatory and non-chronological writing for literacy and age-appropriate data interpretation (and use of statistics) in mathematics).

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, 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.



YEAR 1 AND 2	YEAR 3 AND 4	YEAR 5 AND 6
<p>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:</p> <ul style="list-style-type: none"> • 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. 	<p>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:</p> <ul style="list-style-type: none"> • 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 • 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. 	<p>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:</p> <ul style="list-style-type: none"> • 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 • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs • using test results to make predictions to set up further comparative and fair tests • using simple models to describe scientific ideas • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of 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.

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

Plan, Do, Record, Review, Identify and Classify, Understanding, Research, Vocabulary

These skills show progression throughout the school building upon the previous years learning and are designed to support the children at Shaw in a curriculum that is broad yet has sufficient depth and challenge to provide a Science Curriculum that develops scientific thinking and skills to enable the children to move to their next step in their education and prepare them for their future.



Key Stage 1 Year 1 and 2

Notes and guidance (non-statutory)

- Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions.
- They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships.
- They should ask people questions and use simple secondary sources to find answers.
- They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.
- These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study.

	Year 1	Year 2
PLAN	-I can ask a few simple questions about the world around us. -I can begin to use some different types of enquiry to answer questions.	-I can ask simple questions about the world around us. -I can begin to use different types of enquiry to answer questions.
DO	-With support, I can observe changes over time. -With direction, I am beginning to notice patterns. -I can begin to perform simple tests. -I can begin to discuss my ideas. -I can begin to say what happened in an investigation.	-I can observe changes over time. -I can say what I am looking for and what I am measuring. -I can measure with nonstandard units and can begin to use simple standard units. -I can use simple equipment eg hand lenses, egg timers. -I am beginning to notice patterns. -I can perform simple tests. -I can discuss my ideas. -I can say what happened in an investigation.
RECORD	-I can begin to collect simple data. -I can begin to record data in a table my teacher has provided. -I can begin to communicate my findings in a variety of ways.	-I can collect simple data. -I can record data in a table my teacher has provided. -I can communicate my findings in a variety of ways.
REVIEW	-I can begin to talk about what I have found out. -I can begin to explain how I carried out my enquiry. -I can begin to suggest simple changes to my enquiry.	-I can talk about what I have found out to suggest answers to questions. -I can explain how I carried out my enquiry. -I can suggest simple changes to my enquiry.
IDENTIFY AND CLASSIFY	- I can explain where further additional items could be placed in a sorting/grouping task.	- I can sort and record into two groups in which one group has a feature and the other doesn't (Carroll Diagrams).
UNDERSTANDING	-I can say how science helps us in our daily lives. -I can say how science can be dangerous eg electricity can give you a shock.	-I can say how science helps us in our daily lives. -I can say how science can be dangerous eg electricity can give you a shock.
RESEARCH	-I can begin to find information to help me from books, computers and other familiar sources.	-I can find information to help me from books, computers and other familiar sources.
VOCABULARY	- I can begin to use simple scientific language. - I can begin to describe what I see eg something is long. - I can begin to compare eg something is longer or shorter.	-I can use simple scientific language. -I can describe what I see. -I can compare eg something is longer or shorter.



Lower Key Stage 2 Year 3 and 4

Notes and guidance (non-statutory)

- They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.
- With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.
- They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.
- Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.
- These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study.

	Year 3	Year 4
PLAN	<ul style="list-style-type: none"> -I can ask some relevant questions about the world around us. -I can use some different types of scientific enquiry to answer questions. -I am beginning to decide which type of enquiry is best to answer my question. - I can make a simple prediction using my prior scientific knowledge and understanding. 	<ul style="list-style-type: none"> -I can ask relevant questions about the world around us. -I can use different types of scientific enquiry to answer questions. -I am beginning to decide which type of enquiry is best to answer my question. -I can make simple predictions and give an explanation based on my everyday experiences and knowledge.
DO	<ul style="list-style-type: none"> -I can set up some simple practical enquiries. Including comparative and fair tests. - I can recognise when a simple fair test is necessary independently. - I can use standard measures and confidently measure to the nearest whole or half unit. -I am beginning to help decide which variables to keep the same and which to change. 	<ul style="list-style-type: none"> -I can set up simple practical enquiries. Including comparative and fair tests. -I can carry out a comparative or fair test that I have planned, ensuring that I change only the necessary variables. - With increased accuracy, I can use standard confidently measure to the nearest whole or half unit or mixed units.
RECORD	<ul style="list-style-type: none"> - I am beginning to collect data in a variety of ways, including labelled diagrams, bar charts and tables. -I am beginning to help decide how to record data. -I am beginning to use some scientific language in my work. 	<ul style="list-style-type: none"> -I can collect data in a variety of ways, including labelled diagrams, bar charts and tables. -I can help decide how to record data. -I can use some scientific language in my work.
REVIEW	<ul style="list-style-type: none"> -I am beginning to draw simple conclusions based on the results of my enquiry. -I am beginning to answer my questions using the results of my enquiry. -I am beginning to use my findings to make new simple predictions, suggest improvements and think of new questions. 	<ul style="list-style-type: none"> -I can draw simple conclusions based on the results of my enquiry. -I can answer my questions using the results of my enquiry. -I can use my findings to make new simple predictions, suggest improvements and think of new questions. -I can begin to think of cause and effect in my explanations.
IDENTIFY AND CLASSIFY	<ul style="list-style-type: none"> -I am beginning to talk about and identify differences and similarities in the properties or behaviour of living things, materials and other scientific phenomena. -I am beginning to identify simple changes related to simple scientific phenomena. -I am beginning to discuss criteria for grouping and sorting and can classify using simple keys. 	<ul style="list-style-type: none"> -I can talk about and identify differences and similarities in the properties or behaviour of living things, materials and other scientific phenomena. -I can identify simple changes related to simple scientific phenomena. -I can discuss criteria for grouping and sorting and can classify using simple keys.
UNDERSTANDING	<ul style="list-style-type: none"> -I am beginning to know which things in science have made our lives better eg computers in schools, hospitals etc -I can begin to understand risk in science. 	<ul style="list-style-type: none"> -I know some things in science which have made our lives better eg computers in schools, hospitals etc -I understand there is some risk in science.
RESEARCH	<ul style="list-style-type: none"> -I can begin to decide when research will help in my enquiry. -I am beginning to carry out simple research on my own. 	<ul style="list-style-type: none"> -I can begin to decide when research will help in my enquiry. -I can carry out simple research on my own.
VOCABULARY	<ul style="list-style-type: none"> -I am beginning to use some scientific language in my work. 	<ul style="list-style-type: none"> -I can use some scientific language in my work.



Upper Key Stage 2 Year 5 and 6

Notes and guidance (non-statutory)
Pupils in years 5 and 6 should use their science experiences to:

- explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.
- They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.
- They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately.
- They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas.
- They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.
- They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

N.B. *These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the programme of study can be met by the end of year 6. Pupils are not expected to cover each aspect for every area of study.*

	Year 5	Year 6
PLAN	<ul style="list-style-type: none"> -I am beginning to explore ideas and ask my own questions about scientific phenomena. -I am beginning to plan different types of scientific enquiry to answer questions. -I am beginning to decide which variables to control. -I can make predictions based on scientific knowledge independently. 	<ul style="list-style-type: none"> -I can explore ideas and ask my own questions about scientific phenomena. -I can plan different types of scientific enquiry to answer questions. -I can decide which variables to control. - I can make predictions based on scientific knowledge and explain why confidently.
DO	<ul style="list-style-type: none"> -I can sometimes set up a range of comparative and fair tests. -I am beginning to explain which variables need to be controlled and why. -I can make a series of measurements adequate for the task. -I am beginning to suggest improvements to my test, giving reasons. 	<ul style="list-style-type: none"> -I can set up a range of comparative and fair tests. -I can explain which variables need to be controlled and why. -I can make a series of accurate measurements adequate for the task independently and confidently. -I can suggest improvements to my test, giving reasons.
RECORD	<ul style="list-style-type: none"> -I am beginning to record data and results of increasing complexity using – scientific diagrams and labels, classification keys, tables, bar graphs, line graphs. -I am beginning to choose how best to present data. -I can use some scientific language in my work. 	<ul style="list-style-type: none"> -I can record data and results of increasing complexity using – scientific diagrams and labels, classification keys, tables, bar graphs, line graphs -I can choose how best to present data. -I can confidently use the correct scientific language when appropriate.
REVIEW	<ul style="list-style-type: none"> -I am beginning to draw scientific, causal conclusions using the results of an enquiry to justify my ideas. -I am beginning to explain my conclusion using scientific knowledge and understanding. -I am beginning to distinguish opinion and facts. -I am beginning to use my findings to make predictions and set up further enquiries. -I can begin to use abstract models to explain my ideas. 	<ul style="list-style-type: none"> -I can draw scientific, causal conclusions using the results of an enquiry to justify my ideas. -I can explain my conclusion using scientific knowledge and understanding. -I can distinguish between opinion and facts. -I can use my findings to make predictions and set up further enquiries. -I can begin to use abstract models to explain my ideas.
IDENTIFY AND CLASSIFY	<ul style="list-style-type: none"> -I am beginning to use keys and other information records to classify and describe living things, materials and other scientific phenomena. -I am beginning to develop my own keys and other information records to classify and describe. -I am beginning to identify changes related to scientific phenomena. 	<ul style="list-style-type: none"> -I can use keys and other information records to classify and describe living things, materials and other scientific phenomena. -I can develop my own keys and other information records to classify and describe. -I can identify changes related to scientific phenomena.
UNDERSTANDING	<ul style="list-style-type: none"> -I am beginning to see how science is useful in lots of different ways. -I am beginning to say which parts of our lives rely on science. -I am beginning to explain the positive and negative effects of scientific developments. 	<ul style="list-style-type: none"> -I can see how science is useful in lots of different ways. -I can say which parts of our lives rely on science. -I can explain the positive and negative effects of scientific developments.
RESEARCH	<ul style="list-style-type: none"> -I am beginning to recognise which secondary source will be most useful to my research. -I can begin to carry out research independently. 	<ul style="list-style-type: none"> -I can recognise which secondary source will be most useful to my research. -I can carry out research independently.
VOCABULARY	<ul style="list-style-type: none"> -I am beginning to confidently use the correct scientific language when appropriate. 	<ul style="list-style-type: none"> -I can confidently use the correct scientific language when appropriate.