

Science	
Concept	A) Working Scientifically
Year Group	
Year 1	<p><u>DCPro statements:</u></p> <ol style="list-style-type: none"> 1. <i>I can ask simple questions about the world around me.</i> 2. <i>I can observe closely, using simple equipment.</i> 3. <i>I can perform simple tests.</i> 4. <i>I can identify and classify.</i> 5. <i>I can use my observations and ideas to suggest answers to questions</i> <p><u>National curriculum: Progression & guidance</u></p> <p>Asking simple questions and recognising that they can be answered in different ways (NC) (DCPro 1 & 5)</p> <ul style="list-style-type: none"> • 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). Where appropriate, they answer these questions with support. • The children answer questions developed with the teacher often through a scenario. • The children discuss their questions and discussions are had surrounding how a plan can be created for investigation together. <p>Observing closely, using simple equipment (NC) (DCPro 2)</p> <ul style="list-style-type: none"> • Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses to make their observations. • They begin to take measurements, initially by comparisons, then using non-standard units. <p>Performing simple tests (NC) (DCPro 3)</p> <ul style="list-style-type: none"> • 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. <p>Identifying and classifying (NC) (DCPro 4)</p> <ul style="list-style-type: none"> • Children use their observations and testing to compare objects, materials and living things. They sort and group these things, using a given criteria. • They use simple secondary sources (such as identification sheets) to name living things.

Year 2

DCPro statements:

1. *I can ask simple questions about the world around me.*
2. *I can observe closely, using simple equipment.*
3. *I can perform simple tests.*
4. *I can identify and classify.*
5. *I can use my observations and ideas to suggest answers to questions*

National curriculum: Progression & guidance

Asking simple questions and recognising that they can be answered in different ways (NC) (DCPro 1 & 5)

- 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.

Observing closely, using simple equipment (NC) (DCPro 2)

- 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.

Performing simple tests (NC) (DCPro 3)

- 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 (NC) (DCPro 4)

- 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.

Year 3

DCPro statements:

1. *I ask relevant questions.*
2. *I can set up simple practical enquiries comparative and fair tests.*
3. *I can make accurate measurements using standard units, using a range of equipment, for example thermometers and data loggers.*
4. *I can gather, record, classify and presenting data in a variety of ways to help in answering questions.*
5. *I can record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.*
6. *I can report on findings from enquiries, including oral and written explanations displays or presentations of results and conclusions.*
7. *I can use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests*
8. *I can identify differences, similarities or changes related to simple scientific ideas and processes.*

National curriculum: Progression & guidance

Asking relevant questions and using different types of scientific enquiries to answer them (NC) (DCPro 1, 4)

- The children consider their prior knowledge when asking questions. They use a range of question stems with some support or guidance. 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 following group discussions with peers and an adult.
- They are aware that secondary sources can be used to answer questions that cannot be answered through practical work.

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (NC) (DCPro 2, 3)

- The children make careful observations.
- They use a range of equipment for measuring length, time, temperature and capacity.
- They use standard units for their measurements with guidance.

Setting up simple practical enquiries, comparative and fair tests (NC) (DCPro 2)

- The children select from a limited range of practical resources provided by the teacher to gather evidence to answer questions generated by themselves or the teacher with support and guidance.
- They follow a plan supported by the teacher to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.

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 (NC) (DCPro 4, 5)

- The children begin to share ideas on how to record and present evidence.

- They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing with support.
- They record their measurements e.g. using tables, tally charts and bar charts on given templates to which they can add headings.
- They record classifications e.g. using tables, Venn diagrams, Carroll diagrams on given templates to which they can add headings.
- Children are supported to present data in order to help with answering the question.

Using straightforward scientific evidence to answer questions or to support their findings (NC) (DCPro 4, 5)

- Children answer their own questions based on observations they have made, measurements they have taken or information they have gained from secondary sources with the guidance and support of the teacher. The answers are consistent with the evidence.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (NC) (DCPro 6)

- They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

Identifying differences, similarities or changes related to simple scientific ideas and processes (NC) (DCPro 7,8)

- Children are supported to interpret their data to generate simple comparative statements based on their evidence.

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (NC) (DCPro 7, 8)

- They draw conclusions based on their evidence.
- They identify ways in which they would do it differently if they repeated the enquiry.
- Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry

Year 4

DCPro statements:

1. *I ask relevant questions.*
2. *I can set up simple practical enquiries comparative and fair tests.*
3. *I can make accurate measurements using standard units, using a range of equipment, for example thermometers and data loggers.*
4. *I can gather, record, classify and presenting data in a variety of ways to help in answering questions.*
5. *I can record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.*
6. *I can report on findings from enquiries, including oral and written explanations displays or presentations of results and conclusions.*
7. *I can use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests I can identify differences, similarities or changes related to simple scientific ideas and processes*

National curriculum: Progression & guidance

Asking relevant questions and using different types of scientific enquiries to answer them (NC) (DCPro 1, 4)

- 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 and peers.
- 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.

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (NC) (DCPro 2,3)

- 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.

Setting up simple practical enquiries, comparative and fair tests (NC) (DCPro 2)

- 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.

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 (NC) (DCPro 4, 5)

- 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.
- 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.

Using straightforward scientific evidence to answer questions or to support their findings (NC) (DCPro 4, 5)

- 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.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions (NC) (DCPro 6)

- They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

Identifying differences, similarities or changes related to simple scientific ideas and processes (NC) (DCPro 7, 8)

- Children interpret their data to generate simple comparative statements based on their evidence.
- They begin to identify naturally occurring patterns and causal relationships.

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions (NC) (DCPro 7, 8)

- They draw conclusions based on their evidence and current subject knowledge.
- They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.
- 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

Year 5

DCPro statements:

1. *I can plan enquiries, including recognising and controlling variables where necessary*
2. *I can take measurements, using a range of scientific equipment, with increasing accuracy and precision*
3. *I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models*
4. *I can report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.*
5. *I can present findings in written form, displays and other presentations.*
6. *I can use test results to make predictions to set up further comparative and fair tests.*
7. *I can use simple models to describe scientific ideas*
8. *I can identify scientific evidence that has been used to support or refute, ideas or arguments.*

National curriculum: Progression & guidance

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (NC) (DCPro 1)

- Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions following an enquiry.
- Given a wide range of resources the children decide with some guidance how to gather evidence to answer a scientific question.
- They choose a type of enquiry to carry out independently.
- They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (NC) (DCPro 2)

- 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).

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (NC) (DCPro 1, 7)

- 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 with support.
- 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 data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (NC) (DCPro 3, 4, 5)

- The children decide how to record and present evidence after conversations with peers.
- They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings 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 begin to understand that presenting data in different ways can help with answering the question.

Using test results to make predictions to set up further comparative and fair tests (NC) (DCPro 6)

- Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

Identifying scientific evidence that has been used to support or refute ideas or arguments (NC) (DCPro 8)

- 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 supports their answer.
- They talk about how their scientific ideas change due to new evidence that they have gathered.

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 (NC) (DCPro 7, 8)

- In their conclusions, children: identify 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.
- They evaluate, the control of variables and the precision and accuracy of measurements.
- They identify any limitations that reduce the trust they have in their data.
- They communicate their findings to an audience using relevant scientific language and illustrations.

Year 6

DCPro statements:

1. *I can plan enquiries, including recognising and controlling variables where necessary*
2. *I can take measurements, using a range of scientific equipment, with increasing accuracy and precision*
3. *I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models*
4. *I can report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.*
5. *I can present findings in written form, displays and other presentations.*
6. *I can use test results to make predictions to set up further comparative and fair tests.*
7. *I can use simple models to describe scientific ideas I can identify scientific evidence that has been used to support or refute, ideas or arguments.*

National curriculum: Progression & guidance

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (NC) (DCPro 1)

- 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.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate (NC) (DCPro 2)

- 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).

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary (NC) (DCPro 1, 7)

- 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 data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs (NC) (DCPro 3,4,5)

- 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 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.

Using test results to make predictions to set up further comparative and fair tests (NC) (DCPro 6)

- Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.
- They draw upon the finding they have already made to extend and expand upon their knowledge of this area by asking further questions about their own findings.

Identifying scientific evidence that has been used to support or refute ideas or arguments (NC) (DCPro 7)

- 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 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 (NC) (DCPro 7, 8)

- 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 and the evidence gained through a variety of investigation.
- 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.
- They communicate their findings to an audience using relevant scientific language, illustrations, diagrams and photographic evidence.

