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| **Working Scientifically Progression** | | | |
|  | **Year 1** | | **Year 2** |
| National Curriculum objectives | * Ask simple questions and recognise that they can be answered in different ways * Perform simple tests | | |
| Scientific enquiry skill: **Questions and planning (method)** | | | |
| Asking questions | By exploring the world around them (through practical activities), ask people questions and use simple secondary sources to find answers.  *Does…./Will…/How does…/Why does…* | | With guidance (through prompting), use what they see, touch, taste, smell to ask questions based on observations. Suggest how to find things out through discussion with the class/group.  *I wonder what/if…* |
| Predicting | Make simple predictions by saying what they think will happen.  *I think that…* | | Through discussion, and simple recording, say what they think will happen using the word ‘predict’.  *I predict that…* |
| Planning | With help, e.g. through class discussion, discuss different ways that a scientific question could be answered. | | With increasing independence, e.g. as part of a group, discuss different ways that a scientific question could be answered. |
| Controlling variables | Carry out simple tests as part of a class/group. | | Carry out simple tests as part of a class/group. Begin to use the vocabulary of ‘fair test’.  Begin to suggest why a test might be fair or unfair.  *I/We made sure that the test was fair by…* |
| Types of scientific enquiry | Compare objects, materials and living things. With help:   * Decide how to sort/group them * Observe changes over time   With guidance, begin to notice patterns and relationships. | | |
| Key vocabulary | question, test, plan, fair, unfair | | question, investigate, investigation, predict, prediction, equipment, enquire, test, plan, fair test, fair, unfair |
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| National Curriculum objectives | * Observe closely using simple equipment | | |
| Scientific enquiry skill: **Measuring and recording results** | | | |
| Units of measurement | Begin to measure and record:   * Lengths or heights * Mass/weight | To the nearest whole number, measure and record   * Lengths or heights (m/cm) * Mass (kg/g) * Capacity (l/ml) * time | |
| Scientific equipment to use | Use simple measures and equipment e.g.   * Hand lenses * Egg timers * Rulers * Scales * Measuring vessels | | |
| Recording | To the nearest whole unit. | | |
| Key vocabulary | Egg timer, magnifying glass, scales, measuring jug, length, height, measure, record | Egg timer, magnifying glass, scales, measuring jug, length, height, measure, record, mass, results | |
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| National Curriculum objectives | * Gather and record data to help in answering questions * Identify and classify | | |
| Scientific enquiry skill: **Presenting results** | | | |
| Presenting results | Present results using simple:   * Pictograms * Tally charts * Block diagrams | Present results using simple:   * Pictograms * Tally charts * Blok diagrams * Simple tables | |
| Sorting and classifying | Use simple diagrams such as a Carrol diagram with one criteria to sort and organise things into groups.  Through practical activities, start to use keys to identify things e.g. types of animals and plants.(GD) | Use diagrams such as Carrol and Venn diagrams to sort and organise things into groups.  Through practical activities, start to use keys to identify things e.g. earwigs, woodlice etc.  Create own simple identification keys. (GD) | |
| Key vocabulary | sort, Carrol diagram, group, pictogram, tally chart, block diagram | Sort, Carrol diagram, Venn diagram, group, pictogram, tally chart, block diagram, questions, criteria, identification key | |
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| National Curriculum objectives | * Use observations and ideas to suggest answers to questions | | |
| Scientific enquiry skill: **Concluding** | | | |
| Drawing conclusions | As part of a class/group, say what they notice. Write in a sentence using a given sentence stem.  *I have noticed that…* | As part of a class/group, say what they have noticed and what this tells them.  *I have noticed that…* | |
| Presenting findings | Record findings using pictures, labels and captions.  Say whether things happened as they expected.  Give reasons for their answers. (GD) | Record findings in pictures, labels, captions and in writing.  Say whether things happened as they expected and if not, why not. (GD)  *I have noticed that…/I was surprised that…* | |
| Key vocabulary | question, picture, label | question, picture, caption, label | |

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| **Working Scientifically Progression** | | | |
|  | **Year 3** | | **Year 4** |
| National Curriculum objectives | * Ask relevant questions and use different types of scientific enquiries to answer them * Set up simple practical enquiries, comparative and fair tests. | | |
| Scientific enquiry skill: **Questions and planning (method)** | | | |
| Asking questions | Suggest how to find out the answer to a given questions or a question that has been raised as part of a group. | | Suggest their own questions to investigate and ways to answer (through discussion). |
| Predicting | Through discussion, use a sentence stem to make and record a prediction and reasons before testing.  *I predict that…because…* | | Through discussion with others, make and record predictions and reasons before testing.  *I predict that…because…* |
| Planning | Through discussion with others e.g. in a group or pair, start to make decisions about the most appropriate type of scientific enquiry and what observations to make in order to answer a question using the support of a sentence stem.  *In order to test this, we will…* | | Help to make decisions about what observations to make and how long to make them for in order to answer a question as well as the best ways for collecting information to answer it.  *In order to test this, we will…* |
| Controlling variables | With support, plan a fair test and explain why it was fair (what variables were kept the same and what variables were changed).  *The variables that I have kept the same are…*  *The variable that I have changed is…* | | Recognise when a simple fair test is necessary to help to decide how to set it up, isolating variables.  Explain why a test is fair and which variables have been isolated.  *The variables that I have kept the same are…*  *The variable that I have changed is…* |
| Types of scientific enquiry | * Observing changes over different periods of time * Noticing patterns * Grouping and classifying * Carrying out comparative and fair tests * Finding things out using secondary sources | | |
| Key vocabulary | question, investigate, investigation, predict, prediction, equipment, test, plan, fair test, variable, control, fair, unfair | | question, investigate, investigation, predict, prediction, equipment, enquire test, plan, fair test, variable, control, fair, unfair, method, methodology |
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| National Curriculum objectives | * Where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. * Make systematic and careful observations. | | |
| Scientific enquiry skill: **Measuring and recording results** | | | |
| Units of measurement | Take accurate measurements using different equipment and units of measure e.g. mm/cm/m, kg/g, l/ml | Take measurements using different equipment and units of measure e.g. mm/cm/m, kg/g, l/ml, units of time | |
| Scientific equipment to use | Begin to say what equipment is needed. Learn how to use the new equipment.   * Rulers/meter sticks/trundle wheels * Scales * Measuring containers * Thermometers * Data loggers * Stopwatches | | |
| Recording | Mixed units e.g. 1kg and 200g | Record to 1 decimal place | |
| Key vocabulary | Egg timer, magnifying glass, scales, measuring jug, length, height, mass, results, measure, record, capacity | Egg timer, magnifying glass, scales, measuring jug, length, height, mass, results, measure, record, capacity, thermometer, (°c), temperature, data logger, stopwatch | |
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| National Curriculum objectives | * Gather, record, classify and present data in a variety of ways to help in answering questions | | |
| Scientific enquiry skill: **Presenting results** | | | |
| Presenting results | Present results using:   * Drawings * Labelled diagrams * Keys * Bar charts * Pictograms * tables | Interpret and present discrete and continuous data using appropriate graphical methods, including:   * labelled diagrams * classification keys * bar charts * tables * time graphs | |
| Sorting and classifying | Use diagrams such as more complex (more than 2 criteria) Venn and Carrol diagrams to sort and organise into groups.  Begin to suggest their own criteria for sorting. (GD) | Begin to suggest their own criteria for sorting and organising things into groups.  With support, begin to using branching tree diagrams to classify things.  Begin to create their own. (GD) | |
| Key vocabulary | sort, Carrol diagram, group, pictogram, tally chart, block diagram, bar chart, scale, table, question, Venn diagram, criteria, identification key, labelled diagram | sort, Carrol diagram, group, pictogram, tally chart, block diagram, bar chart, scale, table, question, Venn diagram, criteria, identification key, labelled diagram, time graph, branching tree diagram | |
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| National Curriculum objectives | * Report in findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. * Report findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables | | |
| Scientific enquiry skill: **Concluding** | | | |
| Drawing conclusions | Describe what they have found using scientific language.  Use findings to draw simple conclusions. (GD)  *I have noticed that…This shows that…* | Use their findings to draw a simple conclusion.  *I can conclude that…/In conclusion…*  Report findings from investigations through written explanations and conclusions. (GD)  Evaluate what they have found using scientific language.  Refer to a graph or diagram to answer a question. (GD) | |
| Presenting findings | Give oral and written explanations using relevant scientific language.  With support, record observations in different ways, using:   * Labelled diagrams * Charts | Present findings in written form using relevant scientific language precisely.  With increased independence, record observations in different ways, using:   * Labelled diagrams * Charts | |
| Key vocabulary | question, picture, caption, label, labelled diagram, results | question, picture, caption, label, labelled diagram, results, conclude, conclusion | |
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| National Curriculum objectives | * Use straightforward scientific evidence to answer questions or to support their findings | | |
| Scientific enquiry skill: **Using evidence to support finding and looking for patterns** | | | |
| Supporting findings | Explain what they have found out and use their measurements to say whether it helps to answer the question. | Find patterns in their evidence or measurements.  Identify differences, similarities or changes related to simple scientific ideas or processes. | |
| Key vocabulary | findings, observation | findings, observation, pattern, differences, similarities | |
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| National Curriculum objectives | * Use 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. | | |
| Scientific enquiry skill: **Further questions** | | | |
| Raising further questions | With support, suggest improvements and predictions for further tests.  Independently suggest improvements and predictions for further test.  Suggest how to improve their work if they did it again. (GD) | Evaluate and communicate methods and findings.  Ask further questions and make predictions based on their data and observations.  *If I know that…then I know that…* | |
| Key vocabulary | improve | improve, evaluate | |

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| **Working Scientifically Progression** | | | |
|  | **Year 5** | | **Year 6** |
| National Curriculum objectives | * Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. | | |
| Scientific enquiry skill: **Questions and planning (method)** | | | |
| Asking questions | Work as part of a group to plan and carry out an enquiry to answer a question. | | Explore different ways to test an idea, choose the best ways and give reasons.  Choose the best way to answer a question and use information from different sources to plan an investigation. (GD) |
| Predicting | Independently suggest and record predictions, using prior knowledge giving reasons for their predictions.  *I predict that…because I know that…/I hypothesise that…because I know that…* | | Use information to make predictions and give reasons for it.  Make a prediction, which links with other scientific knowledge. (GD)  *I predict that…because I know that…/I hypothesise that…because I know that…* |
| Planning | With support, explore different ways to test an idea, choose the best way and give reasons. | | Select and plan the most appropriate type of scientific enquiry to use and answer scientific questions.  We chose to use this method because… |
| Controlling variables | With increasing independence, recognise and control variables. | | Vary one factor whilst keeping the others the same in an experiment and explain why they do this.  State which are dependent and independent variables. (GD) |
| Types of scientific enquiry | * Recognising and controlling variables accurately and fairly, including changes over different periods of time * Noticing patterns, grouping and classifying * Carrying out comparative and fair tests * Finding things out using a wide range of secondary sources | | |
| Key vocabulary | question, investigate, investigations, predict, prediction, equipment, enquire, test, plan, method, methodology, fair test, variable, control, fair, unfair | | question, investigate, investigations, predict, prediction, equipment, enquire, test, plan, method, methodology, fair test, variable, control, fair, unfair, hypothesis, hypothesise, independent variable, dependent variable |
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| National Curriculum objectives | * Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. | | |
| Scientific enquiry skill: **Measuring and recording results** | | | |
| Units of measurement | Take measurements using a range of scientific equipment with increasing accuracy and precision.  Decide which units of measure they need to use. (GD)  With prompting, begin to take repeated readings when appropriate and begin to understand the need to do this to reduce the impact of anomalies. | Decide which units of measurement they need to use.  Independently take repeated readings, understanding the term ‘anomaly’.  Explain why measurements need to be repeated.  Find the mean of a set of data.  Explain qualitative and quantitative data. (GD) | |
| Scientific equipment to use | Explain why they have chosen specific equipment (including ICT based equipment)   * Rulers/meter sticks/trundle wheels * Scales * Measuring containers * Thermometers * Data loggers * Stopwatches | | |
| Recording | Record to 2 decimal places | Record to 2 or 3 decimal places. | |
| Key vocabulary | Egg timer, magnifying glass, scales, measuring jug, length, height, mass, results, thermometer, temperature, data logger, stopwatch, capacity, volume | Equipment, measure, measurement, record, results, anomaly, data logger, stopwatch, thermometer, degrees Celsius, temperature, mean | |
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| National Curriculum objectives | * Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. | | |
| Scientific enquiry skill: **Presenting results** | | | |
| Presenting results | Present results using:   * Scientific diagrams and labels * Classification keys * Bar graphs * Line graphs * tables | Present results using:   * Scientific diagrams and labels * Classification keys * Scatter graphs * Bar graphs * Line graphs * Pie charts | |
| Sorting and classifying | With support, develop their own more complex criteria for sorting and organising things into groups using precise scientific vocabulary.  Develop their understanding of branching tree diagrams, generating their own questions to create their own. | With increasing independence, develop their own more complex criteria for sorting and organising things into groups using precise scientific vocabulary. | |
| Key vocabulary | Sort, Carrol diagram, group, pictogram, tally chart, block diagram, bar chart, scale, table, questions, Venn diagram, criteria, identification key, labelled diagram, time graph, branching tree diagram, line graph, scientific diagram | Sort, Carrol diagram, group, pictogram, tally chart, block diagram, bar chart, scale, table, questions, Venn diagram, criteria, identification key, labelled diagram, time graph, branching tree diagram, line graph, scientific diagram, scatter graph, pie chart, mean, average | |
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| National Curriculum objectives | * Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations. | | |
| Scientific enquiry skill: **Concluding** | | | |
| Drawing conclusions | Use a graph to answer scientific questions.  Explain, in simple terms, a scientific idea and what evidence supports it. (GD)  *I conclude that…because my results suggest that…*  Use the language of cause and effect (causal conjunctions) to explain results e.g. *causing, resulting in, this caused, as a result, consequently*, to explain results. | Find patterns from their data and say what it shows.  *My results show that…This helps me to conclude that…*  Use the language of cause and effect (causal conjunctions) to explain results e.g. *causing, resulting in, this caused, as a result, consequently*, to explain results. | |
| Key vocabulary | Question, picture, caption, label, labelled diagram, conclude, conclusion, pattern, evidence, causing, resulting in | Question, picture, caption, label, labelled diagram, conclude, conclusion, pattern, evidence, causing, resulting in, reliability | |
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| National Curriculum objectives | * Identify scientific evidence that has been used to support or refute ideas or arguments | | |
| Scientific enquiry skill: **Using evidence to support finding and looking for patterns** | | | |
| Using evidence | Find a pattern from their data and explain what it shows.  Say whether their evidence supports or does not support their prediction. | Explain, in simple terms, a scientific idea and what evidence supports it. | |
| Key vocabulary | Findings, observation, pattern, difference, differences, similarity, similarities | Findings, observation, pattern, difference, differences, similarity, similarities, support, disprove | |
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| National Curriculum objectives | * Use test results to make predictions to set up further comparative and fair tests. | | |
| Scientific enquiry skill: **Further questions** | | | |
| Further questions | Use test results to make further predictions.  Link what they have found out to other science.  *I wonder what would happen if I kept the…and …the same, but changed the…* | Use test results to make further predictions and set up further comparative tests. | |
| Key vocabulary | Improve, evaluate | Improve, evaluate, comparative test | |