



# Brookland Junior School

## Science Curriculum Overview

### Intent

At Brookland Junior School, we provide an ambitious, knowledge-rich and enquiry-led science curriculum that is carefully and cumulatively sequenced to build pupils' understanding over time. We create a space where children are inspired and motivated to explore and deepen their understanding of the world around them through a range of engaging approaches that purposefully prepare them for the future. We aim to foster a culture of curiosity, encouraging pupils to ask questions, investigate phenomena and develop a sense of awe and wonder about the natural world.

Our curriculum builds upon pupils' natural curiosity whilst introducing them to the work and achievements of significant scientists. Through this, pupils develop the knowledge, skills and understanding needed to think and work scientifically, drawing connections between their learning and the wider world.

We ensure learning is broad and deep by making purposeful links with other curriculum areas where appropriate. Scientific vocabulary is explicitly taught and revisited, enabling pupils to communicate their understanding accurately and confidently. Through practical enquiry, discussion and investigation, pupils learn to work collaboratively, think critically and justify their ideas using scientific evidence.

Our science curriculum is inclusive by design, with carefully structured learning, practical resources, scaffolds and adaptive teaching approaches ensuring that all pupils, including those with SEND and disadvantaged backgrounds, can access an equally ambitious curriculum and achieve success.

Through meaningful scientific experiences and real-world contexts, pupils develop scientific literacy and an understanding of the role science plays in everyday life, equipping them with the knowledge and skills to become informed, responsible citizens of the future.

**Scientific knowledge (substantive):** Pupils develop secure knowledge, enabling them to understand key scientific concepts, recognise patterns and relationships, and make connections between areas of learning. Knowledge is carefully sequenced and revisited throughout the curriculum, enabling pupils to build upon prior learning, make meaningful connections between concepts and develop increasingly secure scientific understanding. For example, pupils are introduced to electricity in Year 4 before revisiting and extending this knowledge in Year 6.

**Scientific skills (disciplinary):** Pupils learn to think and work as scientists through enquiry and investigation. They develop the skills to question, observe, predict, test, measure, record, analyse and evaluate evidence, enabling them to draw conclusions and communicate findings using precise scientific language.

**Our Key Principles to achieve this are:**

We learn through a range of engaging, practical and memorable methods

We can talk confidently about the science in and around us using scientific language

We ask questions and have the tools and skills to get an answer

We work collaboratively and make learning accessible to all

We can take and apply our learning to the world around us

## Implementation

We ensure a high standard of teaching and learning in science through a curriculum that is progressive, carefully sequenced, highlights key skills and the five enquiry types and is engaging and adapted to pupils' needs throughout the school. Content is carefully and cumulatively sequenced across the school, ensuring pupils revisit and build upon prior learning over time, strengthening long-term memory and developing secure scientific understanding. Through using a wide range of resources and the facilities local to us, we are able to support teachers in their planning and implementation of the science curriculum. This enables teachers to engage pupils' interests, use support staff effectively and include current events where appropriate. We build upon the vocabulary, knowledge and skills developed in previous years, including those introduced within the Infant curriculum and develop reflective thinkers who can evaluate their own learning. At the start of each unit, pupils are provided with a glossary page containing key scientific vocabulary, which supports understanding of subject-specific language, promotes links to prior learning and acts as a reference point throughout the unit. In addition, three key scientific words are explicitly taught and revisited within every lesson, providing regular opportunities for pupils to develop, apply and embed precise scientific vocabulary. As children's knowledge and understanding increase, they become more proficient in selecting and using scientific equipment, collating and interpreting results and increasingly confident in drawing conclusions based on real evidence. The 'Brookland Toolkit' and Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced in-keeping with the topics in a collaborative learning style. Existing knowledge is checked at the beginning of units using cover pages and teachers use ongoing formative assessment, questioning, retrieval practice and pupil discussion to identify misconceptions and inform future learning. Teachers also complete half-termly assessment grids to evaluate pupils' understanding of the taught curriculum, monitor progression in knowledge and working scientifically skills and ensure pupils are secure in their learning before moving on.

*"We have learnt more things so we can think about more things and link them and we can discover more because we know more. I can write in more detail in lessons and use more scientific vocabulary."*

Regular enrichment opportunities, including external visitors and specialist workshops, provide broader curriculum experiences and support the acquisition and application of scientific knowledge and skills. These experiences help bring learning to life, inspire curiosity and demonstrate the relevance of science in the wider world.

### Inclusion & Adaptive Teaching

All pupils are supported through scaffolded learning, practical resources, visual supports, scientific vocabulary banks, modelling and adaptive teaching approaches. Learning is designed to provide appropriate challenge for all learners whilst maintaining high expectations and ensuring access to an equally ambitious science curriculum.

### Pupil Voice

Pupil voice plays a significant role at Brookland. Pupils provide feedback on their learning in science through termly whole-school meetings, enabling leaders to evaluate the impact of the curriculum and make informed adaptations to planning and provision where appropriate. This ensures pupils' experiences help shape the ongoing development of science across the school.

### **Working Scientifically**

The five enquiry types and Working Scientifically skills are progressively developed across the key stage. Pupils learn to ask questions, make predictions, observe closely, gather and record data, analyse results and draw conclusions based on evidence. The Brookland Toolkit supports the systematic development of these skills, ensuring pupils become increasingly independent and confident scientists as they move through the school.

### **Breadth, Depth and Enrichment**

We bring science to life through a range of practical, engaging and memorable learning experiences. Opportunities for oracy are embedded within lessons through partner talk, group discussion and collaborative investigations, enabling pupils to explain their thinking, justify conclusions and use precise scientific vocabulary confidently.

We make purposeful use of our local environment to provide meaningful scientific experiences. For example, Year 3 pupils visit Big Wood to investigate and compare different types of soil, developing their observational, enquiry and classification skills through practical fieldwork.

Sustainability and gardening are progressively developed across the key stage, enabling pupils to apply scientific knowledge in real-world contexts. Pupils contribute to long-term projects such as growing and nurturing plants, creating habitats for wildlife, producing compost for use in the school gardens and designing products such as terrariums to sell. These experiences help pupils understand environmental responsibility, enterprise and the impact of sustainable practices, whilst allowing them to see how their learning contributes to projects across the school community.

Learning is further enriched through workshops, visitors and other real-world experiences that help pupils understand the importance and relevance of science in everyday life and future careers.

## **Impact**

At Brookland Junior School, pupils develop the knowledge and skills needed to move confidently to the next stage of their education. By the end of KS2, pupils demonstrate secure understanding of key scientific concepts and can apply their knowledge to explain, question and investigate the world around them. They confidently use scientific vocabulary, work collaboratively, think critically and draw conclusions based on evidence. Through regular opportunities to work scientifically, pupils develop resilience, curiosity and independence. They increasingly ask meaningful questions, plan investigations, evaluate evidence and make informed decisions based on their findings.

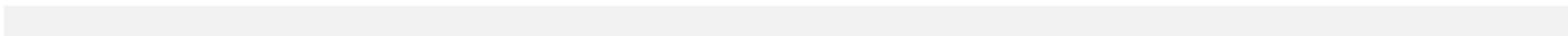
Fast-paced retrieval activities are built into lessons and units so that pupils regularly revisit prior learning, helping them remember more over time and make connections between concepts.

The impact of our curriculum is demonstrated through evidence-based assessment of what pupils know, remember and can do. Progress is measured through formative assessment such as half-termly assessment grids, supported by book work, formative assessment and end-of-year reports providing clear evidence of pupils' understanding, application of skills and readiness for the next stage of education. Alongside quality, continuous assessment for learning by class teachers, pupils evaluate their learning each lesson through the use of green pen comments which reflect on the key skill or content during the lesson. Identified key skills in the planning are deep marked each term. We also gather pupil voice through whole school meetings, with a focus on impact of their learning. Pupils are able to articulate their learning confidently and demonstrate increasing depth of understanding through discussion, written work and practical enquiry.

Our achievement of the Primary Science Quality Mark (PSQM) reflects the strength of science teaching and learning across the school and recognises our commitment to providing a high-quality, ambitious and inclusive science curriculum that enables all pupils to succeed.

| Year 3 Science Overview              |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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|                                      | Autumn 1                                                                                                                                                                                                                                                                                                                                                                                                                                     | Autumn 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Spring 1                                                                                                                                                                                                                                                                                                    | Spring 2                                                                                                                                                                                                                                                                                           | Summer 1                                                                                                                                                                                                                                                                                                                                                                                                              | Summer 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Year 3<br><br>Science<br>Unit Skills | <b>Light</b><br><br>(1, 2, 7, 9)                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Forces and magnets</b><br><br>(1, 2, 3, 4, 7)                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Rocks</b><br><br>(1, 2, 7, 9)                                                                                                                                                                                                                                                                            | <b>Animals including humans (nutrition, skeletons, muscles)</b><br><br>(2, 3, 9)                                                                                                                                                                                                                   | <b>Plants</b><br><br><b>Sustainability and gardening</b><br><br>(1, 2, 3, 7, 8)                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                      | <p>Recognise that they need light in order to see things and that dark is the absence of light.</p> <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object.</p> <p>Find patterns in the way that the size of shadows change.</p> | <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet.</p> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which</p> | <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p> | <p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> | <p>To understand what impacts biodiversity.</p> <p>To observe and reports on how rewilding can increase biodiversity in my local area.</p> <p>To plant wildflower seeds in key school locations; growing and nurturing plant life.</p> <p>To understand deforestation and the impact on our natural environment.</p> <p>Make paper using natural resources and understand the processes involved in making paper.</p> | <p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed</p> |

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| <b>Year 3</b><br><br><b>Working Scientifically</b> | <ol style="list-style-type: none"> <li>1. Beginning to use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</li> <li>2. Beginning to identify differences, similarities or changes related to simple scientific ideas and processes.</li> <li>3. Beginning to use straightforward scientific evidence to answer questions or to support their findings.</li> <li>4. Beginning to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</li> <li>5. Beginning to gather, record, classify and present data in a variety of ways to help in answering questions.</li> <li>6. Beginning to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</li> <li>7. Beginning to set up simple practical enquiries, comparative and fair tests.</li> <li>8. Beginning to make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</li> <li>9. Beginning to ask relevant questions and using different types of scientific enquiries to answer them.</li> </ol> |                   |  |  |  |            |





# Year 4 Science Overview

|                                      | Autumn 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Autumn 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Spring 1                                                                                                                                                                                                                                                                          | Spring 2                                                                                                                                                                                                                                                                                                             | Summer 1                                                                                                                                                                                                                                                                                                                       | Summer 2                                                                                                                                                                                                                                                                                                                                                                                                               |
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| Year 4                               | <b>Electricity</b><br><b>(1,3,4,5,6,8,9)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Sound</b><br><b>(1,2,3,4,5,7,8,9)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Animals including humans (food-chains, teeth, digestive (2,3,4,5,6)</b>                                                                                                                                                                                                        | <b>Sustainability and gardening</b><br><b>(3 4,8,9)</b>                                                                                                                                                                                                                                                              | <b>Living things and their habitats</b><br><b>(2,4,5,6)</b>                                                                                                                                                                                                                                                                    | <b>States of Matter</b><br><b>(1,3,4,5,6,7,8,9)</b>                                                                                                                                                                                                                                                                                                                                                                    |
| Year 4<br><br>Science<br>Unit Skills | <p>Identify common appliances that run on.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> | <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> | <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> | <p>To investigate sources of renewable energy.</p> <p>To understand the environmental impact of electricity usage.</p> <p>To identify ways that we can reduce energy usage.</p> <p>To explore how soil type affects plant growth.</p> <p>To design and create sustainable garden areas for different conditions.</p> | <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> | <p>Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> |

Year 4

Working  
Scientifically

1. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
2. Identifying differences, similarities or changes related to simple scientific ideas and processes.
3. Using straightforward scientific evidence to answer questions or to support their findings.
4. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
5. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.
6. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
7. Setting up simple practical enquiries, comparative and fair tests.
8. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
9. Asking relevant questions and using different types of scientific enquiries to answer them

# Year 5 Science Overview

|                                   | Autumn 1                                                                                                                                                                                                                                                                                                                                                                                    | Autumn 2                                                                                                                                                                                                                                                                                                                                                                    | Spring 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Spring 2                                                                                                                                                                         | Summer 1                                                                                                                              | Summer 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <b>Year 5</b>                     | <b>Forces</b><br><b>(1,2,3,4,5,6)</b>                                                                                                                                                                                                                                                                                                                                                       | <b>Earth And Space</b><br><b>(1,2,3,6)</b>                                                                                                                                                                                                                                                                                                                                  | <b>Sustainability and gardening</b><br><b>(1,3,6)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Living Things And Their Habitats</b><br><b>(1,6)</b>                                                                                                                          | <b>Animals Including Humans</b><br><b>(1,4,6)</b>                                                                                     | <b>Properties And Changes Of Materials</b><br><b>(1,2,3,4,5,6)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Year 5 Science Unit Skills</b> | <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> | <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> | <p>To explore how global warming occurs.</p> <p>To understand what a 'greenhouse gas' is and how it affects our planet.</p> <p>Work scientifically and practically for children to think of ways to reduce their own carbon footprint.</p> <p>To explain how organic matter decomposes and becomes compost.</p> <p>To create an indoor garden, exploring the conditions needed for plant growth.</p> <p>Planning and preparing outdoor vegetable beds ready for Spring planting.</p> | <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p> | <p>Describe the changes as humans develop to old age.</p> <p>Describe how vaccines have developed and helps support human health.</p> | <p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p> |

Year 5

Working  
Scientifically

1. Beginning to identify scientific evidence that has been used to support or refute ideas or arguments.
2. Beginning to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
3. Beginning to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
4. Beginning to record data and results of using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
5. Beginning to use test results to make predictions to set up further comparative and fair tests.
6. Beginning to report and represent 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.

## Year 6 Science Overview

|                                      | Autumn 1                                                                                                                                                                                                                                                                                       | Autumn 2                                                                                                                                                                                                                                                                                                                                                                                                                                     | Spring 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Spring 2                                                                                                                                                                                                                                                                                                                                         | Summer 1                                                                                                                                                                                                                                                                                                                                                                         | Summer 2                                                                                                                                                                                                                                                                                              |
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| Year 6                               | <b>Living things and their habitats (classification)</b><br><br>(1,4,6)                                                                                                                                                                                                                        | <b>Evolution and inheritance</b><br><br>(1,6,4)                                                                                                                                                                                                                                                                                                                                                                                              | <b>Light</b><br><br>(2,3,4,6)                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Animals including humans (circulatory system etc)</b><br><br>(2,3,4,5,6)                                                                                                                                                                                                                                                                      | <b>Electricity</b><br><br>(2,3,6)                                                                                                                                                                                                                                                                                                                                                | <b>Sustainability and gardening</b><br><br>(1,2,5)                                                                                                                                                                                                                                                    |
| Year 6<br><br>Science<br>Unit Skills | Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.<br><br>Give reasons for classifying plants and animals based on specific characteristics. | Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.<br><br>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to parents.<br><br>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. | Recognise that light appears to travel in straight lines.<br><br>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.<br><br>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.<br><br>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. | Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.<br><br>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.<br><br>Describe the ways in which nutrients and water are transported within animals, including humans. | Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.<br><br>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.<br><br>Use recognised symbols when representing a simple circuit in a diagram. | Explore how light pollution affects human and animal behaviour.<br><br>Explore how renewable energy, such as solar and wind power, is used to generate electricity.<br><br>Create and maintain gardening beds using mulch and compost.<br><br>Grow and tend to seasonal vegetables to use in cooking. |
| Year 6<br><br>Working                | 1. Identifying scientific evidence that has been used to support or refute ideas or arguments.                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                       |

## Scientifically

2. Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
3. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
4. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
5. Using test results to make predictions to set up further comparative and fair tests.
6. 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.