



Riversdale Primary School

"A nurturing, ambitious and values led school."

Science Policy

Date: 16th July 2025

Review Date: 9th July 2028



LEGAL FRAMEWORK

This policy has due regard to all relevant legislation and statutory guidance including, but not limited to, the following:

- DfE (2013) *National curriculum in England: science programmes of study*
- DfE (2024) *Statutory framework for the early years foundation stage*

INTENT

Through high-quality science teaching, we aim for pupils at Riversdale to develop a clear understanding of key scientific concepts in biology, chemistry, and physics. Our engaging and in-depth curriculum will support pupils in acquiring the skills which are essential to work scientifically, such as observing, testing, and drawing conclusions, as we believe that such skills enable pupils to independently explore the world around them, tapping into their natural curiosity and prompting them to ask: "Why?"

Science at Riversdale is accessible to all pupils, regardless of their confidence, prior schooling, or individual support needs, whilst also challenging them to deepen their learning and engage in critical thinking. We aim to equip students with a solid scientific foundation and the confidence to think scientifically, empowering them in other areas of their lives and preparing them for future study.

IMPLEMENTATION

At Riversdale, all pupils are exposed to high-quality science teaching and learning experiences which allow them to explore and build upon scientific concepts. Planning carefully balances theoretical with practical exploration, to allow pupils to experience the ideas in a real-life setting, as these promote a deeper understanding, and support the process of moving learning from working memory into long-term memory.

As part of our Science teaching, pupils will have the opportunity to tackle problems, form questions, generate and test ideas. As they progress through the school, they will also begin to apply their prior learning to decide how to seek solutions to a range of scientific questions. They are immersed in scientific vocabulary, which aids their knowledge and understanding not only of the subject matter they are studying, but of the world around them and links are made to prior learning so that pupils can see how their knowledge around a concept is progressing and deepening. Where possible, pupils will explore their outdoor environment and locality, to further develop their scientific enquiry and investigative skills.

CURRICULUM PROGRESSION

At Riversdale Primary School we believe in the importance of all children developing a deep understanding of science and in embedding the substantive knowledge and disciplinary skills into their long-term memory. As such, the progression of science has been carefully mapped, with a consideration to connected subject matter and opportunities to revisit specific concepts over time.

This is evidenced in the Riversdale Science Progression Document which details progression across year groups in 10 distinct disciplinary concepts:

- Animals Including Humans
- Evolution & Inheritance
- Living Things & Their Habitats
- Plants
- Materials
- Earth & Space
- Electricity

- Forces
- Light
- Sound

TECHNICAL KNOWLEDGE DOMAINS

The ten technical knowledge domains in science are introduced in a way that builds complexity as pupils advance through the school. Each domain is revisited to develop depth, secure foundational understanding and prepare pupils for more abstract scientific ideas in secondary education.

Animals Including Humans:

Pupils begin by identifying and naming common animals, including humans, and recognising basic needs for survival. They learn about life cycles, human growth, and the importance of nutrition, hygiene, and exercise. Over time, they build a more detailed understanding of bodily systems such as the skeletal, muscular, digestive and circulatory systems. By the end of primary school, pupils can describe the key functions of these systems and relate them to health and lifestyle choices.

Evolution and Inheritance:

This domain is introduced in upper key stage 2, where pupils learn that living things change over time and that characteristics are passed from parents to offspring. They explore fossil evidence, recognise variation within a species, and understand that adaptation can lead to evolution. Pupils are encouraged to think scientifically about how the environment can influence survival and how these ideas link to natural selection.

Living Things and Their Habitats:

Pupils first explore the differences between living, dead and never-living things, and are introduced to simple habitat types. They learn to classify animals and plants based on observable characteristics and understand basic needs and interdependence. As they progress, pupils' study more complex classification systems, life processes and the role of reproduction and environmental factors in the survival of species.

Plants:

This domain begins with naming common plants and identifying their basic structures. Pupils then explore what plants need to grow and how water and nutrients are transported. They study the life cycle of flowering plants, including pollination, seed formation and dispersal. By the end of primary school, pupils understand the function of each plant part and can explain how plant growth is affected by environmental conditions.

Materials:

Pupils start by identifying and naming everyday materials and discussing their properties. They explore how materials can change shape and how properties make materials suitable for different uses. Over time, pupils investigate reversible and irreversible changes, including dissolving, melting and chemical reactions. By the end of primary school, they understand how to compare and group materials and can justify choices based on scientific testing.

Earth and Space:

Introduced in key stage 2, pupils learn about the movement of the Earth and Moon relative to the Sun, and how this explains day, night, seasons and phases of the Moon. They explore the structure of the solar system and use models to represent the relative sizes and distances of celestial bodies. By the end of primary school, pupils can describe the position and movement of planets and apply observational evidence to explain astronomical phenomena.

Electricity:

Pupils begin by constructing simple circuits using batteries, bulbs, wires and switches. They learn to recognise conductors and insulators and identify common electrical appliances. As they progress, pupils investigate how the components of a circuit affect its function, including brightness and motor speed. By the end of primary school, they can design and test more complex circuits, using scientific symbols and understanding circuit diagrams.

Forces:

Early work focuses on pushes and pulls and how objects move on different surfaces. Pupils explore gravity, friction, air resistance and water resistance, conducting practical investigations to observe these forces in action. Later, they are

introduced to mechanisms such as levers, pulleys and gears that magnify force. By the end of primary school, pupils understand that forces act in pairs and can predict the effects of multiple interacting forces.

Light:

Pupils begin by recognising that light is needed to see and that dark is the absence of light. They investigate how light travels, how shadows are formed, and how reflective surfaces can redirect light. As they advance, pupils learn about refraction and how light behaves when it moves between materials. By the end of primary school, they can explain how light enables vision and understand how lenses, mirrors and prisms affect the path of light.

Sound:

Pupils explore how sounds are made and how they travel through different materials. They learn that vibrations are responsible for sound and that pitch and volume can be changed. Through investigation, they explore how distance and materials affect the transmission of sound. By the end of primary school, pupils understand that sound energy requires a medium to travel and can use models to explain how it is produced and detected.

WORKING SCIENTIFICALLY SKILLS

Working Scientifically is at the heart of science education and underpins pupils' understanding of scientific concepts. It enables children to think, act and reason like scientists - to ask questions, make predictions, plan and carry out investigations, observe closely, record findings, and draw conclusions based on evidence. Through these skills, pupils develop curiosity, critical thinking, and an understanding of how scientific knowledge is built. Working Scientifically gives meaning to the substantive content taught and helps children apply their learning to real-world contexts, preparing them to participate thoughtfully and responsibly in an increasingly scientific and technological world.

As such, the school's science progression document, outlines how these specific skills progress and grow in complexity across the key stages. In the early years of primary science, pupils begin by asking simple questions, making observations, and using basic equipment to explore the world around them. They learn to perform simple tests, identify and classify objects, and talk about what they have seen using everyday language.

As they move through the school, pupils are introduced to the language of scientific enquiry and are taught to plan and carry out fair tests with increasing independence. They develop precision in using a range of scientific equipment, begin to take accurate measurements, and record data systematically using drawings, tables and charts.

By upper key stage 2, pupils are able to select appropriate enquiry types, pose relevant scientific questions, and justify their approach. They analyse patterns in data, draw conclusions linked to evidence, and evaluate the reliability of their findings. By the end of Year 6, pupils are expected to communicate their scientific understanding clearly using scientific language and begin to consider how scientific evidence can be used to support or refute ideas.

CURRICULUM PLANNING

Science units are sequenced to revisit key concepts and build complexity progressively from early years through to Year 6. This ensures pupils deepen their conceptual understanding while applying disciplinary knowledge in a range of contexts. Substantive content - such as knowledge about plants, materials or forces - is always taught alongside relevant enquiry skills, enabling pupils to learn how scientific knowledge is established and refined.

In Key Stage 1, pupils undertake four discrete units of learning, spread across the six half terms. In Key Stage 2, this increases to five units of learning. These cover the core domains of biology, chemistry and physics, ensuring a balanced breadth of scientific understanding over time. One of these units, delivered in the spring term, is dedicated exclusively to developing and assessing pupils' Working Scientifically skills through a focused, large-scale investigation. Whilst this is a time dedicated to explicit teaching of the skills, they are applied and referred to throughout all science lessons across the academic year.

Within each unit of learning, pupils will be supported to:

Ask Questions by:

- Generating questions independently based on curiosity and scientific experience.
- Selecting appropriate enquiry types to explore a question.

- Considering prior knowledge and recognising when to use secondary sources.

Enquire and Investigate by:

- Planning investigations, selecting and using resources appropriately.
- Carrying out a range of enquiry types including comparative and fair testing, observation over time, research, pattern seeking, and classification.

Observe and Measure by:

- Using equipment accurately and with increasing precision across the key stages.
- Taking systematic measurements and making careful observations, including repeat readings where appropriate.

Record and Present Data by:

- Choosing how to represent data using tables, graphs and diagrams suited to the purpose.
- Presenting information using appropriate scientific vocabulary and conventions.

Conclude and Evaluate by:

- Drawing conclusions from evidence and using subject knowledge to explain findings.
- Reflecting on the accuracy and reliability of methods and results, and suggesting improvements or raising new questions.

To support teachers in delivering a consistent and progressive curriculum, Teacher Knowledge Organisers are provided for each unit. These outline:

- The key disciplinary skills and substantive knowledge to be taught.
- Recommended retrieval questions and assessment opportunities.
- Guidance on how working scientifically should be integrated into the lessons.

Pupils are also provided with Knowledge Organisers at the start of each unit which:

- Clearly identify the prior learning they will build upon.
- Outline the sequence of lessons and key learning objectives.
- Highlight the most significant scientific concepts and vocabulary.
- Include visual representations and contextual examples to support understanding.

These organisers are referred to regularly throughout the unit, reinforcing retrieval, supporting independence, and helping pupils make links between knowledge and the methods used to uncover it. This approach ensures pupils develop both a robust understanding of scientific concepts and the practical skills to investigate them.

LESSON STRUCTURE

Science is taught through discrete, meaningful lessons that take place weekly throughout the academic year. Timetabling is structured to ensure pupils regularly revisit and build upon prior scientific knowledge and disciplinary skills, enabling learning to be embedded over time rather than delivered in isolated blocks. Regular retrieval practice supports pupils in transferring key knowledge from their working memory into their long-term memory. Where appropriate, links to other curriculum areas may be made; however, these are carefully considered and only included where they enhance—not dilute—the core scientific content.

In the **Foundation Stage**, pupils develop early scientific understanding through exploratory, hands-on experiences. They are given opportunities to *"explore the natural world around them"*, observing changes, asking questions, and using all their senses. These experiences are facilitated through both adult-led tasks and child-initiated play, supported by enhanced provision.

Pupils in **Key Stages 1 and 2** follow the school's consistent lesson structure, which is informed by *Rosenshine's Principles of Instruction*. Lessons typically include:

- **Retrieval Practice**
Daily, weekly and monthly review of prior learning to strengthen long-term memory and make links to current content.

- **New Learning in Small Steps**
 - *Modelling*: New content is introduced clearly and explicitly, with teachers using visual representations, scientific vocabulary and worked examples.
 - *Questioning*: Teachers use targeted questioning to check for understanding and deepen pupils' thinking.
- **Guided Practice**
Pupils engage in structured enquiry or problem-solving with scaffolds and support appropriate to their stage of learning. Teachers provide timely feedback and address misconceptions in real time.
- **Independent Practice**
Pupils apply their knowledge and skills through purposeful tasks, investigations, or written outcomes. Tasks are pitched to ensure an appropriate level of challenge, with a minimum expectation that most pupils experience success 80% of the time.

Throughout all lessons, pupils are encouraged to work independently, in pairs, or collaboratively in groups depending on the nature of the task and the scientific enquiry being undertaken. This flexible structure allows for varied approaches to investigation, reflection, and the communication of scientific understanding.

By embedding consistent instructional routines and a strong focus on disciplinary skill development, our lesson structure ensures all pupils are equipped not only with scientific knowledge, but with the thinking and practical skills needed to work scientifically and think like scientists.

ASSESSMENT

To ensure that pupils are progressing in their science learning, assessment is integrated throughout the curriculum. Teachers use both formative and summative assessment methods to monitor pupils' understanding and skills development. Formative assessments, such as observational notes and peer evaluations, help track individual progress and inform future lesson planning. Summative assessments, including investigation write-ups and end-of-unit assessments ensure that pupils are meeting the expected learning outcomes by the end of each academic year. The curriculum also emphasises the development of self-assessment and reflective skills, encouraging pupils to evaluate their work and identify areas for improvement.

INCLUSION

The school is committed to ensuring pupils of all backgrounds and abilities can access the curriculum. The subject leader will review the content of the curriculum and any relevant assessment or teaching practices, and make sure any necessary reasonable adjustments are arranged, so that all pupils can access the learning.

- Tasks are adapted to ensure pupils of all abilities are challenged.
- Reasonable adjustments are made by the class teacher and subject leader in collaboration with the SENCo and other relevant members of staff.
- The SENCo will review reasonable adjustments on a termly basis to ensure they remain suitable for pupils.
- Reasonable adjustments are carried out in accordance with the school's Equal Opportunities Policy, SEND Policy and EAL Policy.

HEALTH AND SAFETY

When working with tools, equipment and materials, in practical activities and in different environments, including those that are unfamiliar, pupils will be taught:

- about hazards, risks and risk control.
- to recognise hazards, assess consequent risks and take steps to control the risks to themselves and others.
- to use the information to assess the immediate and cumulative risks.
- to manage the environment to ensure the health and safety of themselves and others.
- to explain the steps that they must take to control risks.

The location and storage of consumable items can be found in class areas. Leaders/class teachers replace their stock/order new requirements as needed or liaise with science lead for purchase of larger or more significant resources. A limited number of tools and non-consumable items can be found in the science cupboard located in the hallway linking the middle hall and the Y2 hallway.

IMPACT

- Each pupil's progress in science is assessed against the expectations outlined in the school's progression documentation, which includes both substantive knowledge in biology, chemistry and physics, and the disciplinary skills of working scientifically.
- Teachers use ongoing formative assessment during lessons to check understanding, address misconceptions and adapt teaching. End-of-unit assessment opportunities are also built into the curriculum to ensure pupils have secured key knowledge and enquiry skills.
- Pupils' scientific attainment is reported to parents through termly data overviews, the annual written report and discussed during parent-consultation evenings. Where appropriate, individual pupil targets or support strategies may also be shared.
- Pupils are given regular opportunities to reflect on their learning, including through self-assessment and peer discussion. This helps them to articulate their understanding using scientific vocabulary and recognise their own progress over time.
- The annual spring term unit dedicated to working scientifically enables teachers to assess pupils' practical application of enquiry skills in greater depth, including planning investigations, collecting data and drawing evidence-based conclusions.
- Over time, pupils demonstrate increased confidence in thinking scientifically: they ask more sophisticated questions, apply their knowledge to new contexts and begin to recognise the role of evidence and experimentation in developing scientific understanding.
- As a result of our carefully sequenced and inclusive curriculum, pupils at Riversdale leave Year 6 with a secure understanding of core scientific concepts and a well-developed set of investigative skills. They are well prepared for the next stage of their education and able to approach science with curiosity, confidence and critical thinking.

ROLES AND RESPONSIBILITIES

Governors

- Ensuring a broad and balanced science curriculum is implemented across all key stages.
- Ensuring the science curriculum is accessible to all pupils, including those with SEND or additional needs.
- Supporting and challenging school leaders to secure high standards in science education.

Headteacher / Deputy Headteacher (Quality of Education)

- Overseeing the overall implementation of this policy.
- Ensuring the science curriculum is delivered consistently across the school.
- Allocating sufficient resources to support effective teaching and learning in science.
- Ensuring that provision enables all pupils to achieve well and make progress.
- Appointing and supporting a science subject leader to lead the school's approach to science.

Subject Leader

- Developing and reviewing the science policy, curriculum maps and progression documentation.
- Monitoring changes to the national curriculum and advising staff on necessary adaptations.
- Leading the monitoring of science teaching and learning, including lesson observations, book looks, and pupil voice.
- Providing support, guidance and CPD to staff to ensure high-quality science teaching.
- Organising the sourcing and management of science resources, including conducting an annual audit.
- Leading the strategic implementation of the Working Scientifically strand and ensuring progression in disciplinary knowledge.
- Keeping up to date with developments in science education and sharing these with staff, including through staff meetings and coaching.
- Tracking and evaluating pupil progress and attainment in science and sharing outcomes with SLT.
- Liaising with external bodies such as local secondary schools, the local authority, and science networks where relevant.

Class Teacher

- Delivering science lessons in line with this policy and the school's curriculum plan.

- Liaising with the science subject leader on curriculum coverage, resourcing and individual pupil support.
- Ensuring that all statutory content, including Working Scientifically skills, is taught across the year.
- Monitoring pupil progress and recording this in line with school assessment practices.
- Reporting progress and attainment to parents through written reports and consultation evenings.
- Identifying and reporting any concerns or gaps in science provision to the subject leader or SLT.
- Engaging in relevant CPD to support effective delivery of the science curriculum.

MONITORING & REVIEW

This policy is monitored and reviewed by the science subject leader.

This policy will be reviewed at least every three years.