



Science – Intent, Implementation and Impact

Intent

At Goathland Primary School, our science curriculum is designed to develop children's natural curiosity, sense of wonder, and desire to explore the world around them. Our intent is to provide a rich and engaging science education that enables pupils to:

- Develop **scientific knowledge and conceptual understanding** across biology, chemistry, and physics.
- Understand the **nature, processes, and methods of science** through practical enquiry and investigation.
- Recognise the **uses and implications of science** in the wider world and in their own lives.
- Build **progressive scientific vocabulary**, reasoning, and communication skills.
- Develop an appreciation of science's role in explaining natural phenomena and addressing global challenges.

We aim for pupils to become independent thinkers and investigators who are confident to ask questions, predict outcomes, collect and interpret evidence, and draw reasoned conclusions. Science at Goathland is designed to be inclusive, hands-on, and relevant to our **local context**, connecting learning to the natural environment of the **North York Moors**, local habitats, and community heritage.

Implementation

Our science curriculum follows the **National Curriculum for Science** and is structured through long-term plans that ensure coherent progression of both knowledge and working scientifically skills.

Curriculum Structure

- **Key Stage 1** follows a two-year rolling programme, covering all statutory topics:
 - *Cycle A:* Everyday Materials, Plants (Y2 objectives), Animals Including Humans (Y1 objectives), Seasonal Changes.
 - *Cycle B:* Uses of Everyday Materials, Animals Including Humans (Y2 objectives), Living Things and Their Habitats, Seasonal Changes.These units emphasise observation, pattern-seeking, and simple testing through real-life contexts and outdoor learning.
- **Key Stage 2** follows a four-year rolling cycle (A–D), ensuring coverage of all areas of the curriculum:
 - *Cycle A:* Forces and Magnets, Earth and Space, Light, States of Matter, Plants.
 - *Cycle B:* Electricity, Sound, Animals Including Humans, Evolution and Inheritance, Living Things and Habitats.
 - *Cycle C:* Properties of Materials, Rocks, Plants, Forces, and Habitats.
 - *Cycle D:* Electricity, Sound, Animals Including Humans, Living Things and their Habitats (including microorganisms).

Each cycle includes planned opportunities for **working scientifically** through a range of **scientific enquiries** linked to specific focuses on the TAPS Working Scientifically Cycle:

- Asking questions and planning enquiry
- Set up an enquiry
- Observe and Measure
- Record
- Interpret and Report
- Evaluate

TAPS Working Scientifically Cycle



Examples of investigations include:

- *Mould investigation (Microorganisms)*
- *Friction investigation (Forces)*
- *Paper towel absorption test (Properties of Materials)*
- *Shadow length enquiry (Light)*
- *Heart rate and exercise (Humans)*

Progression and Depth

The *Progression in Science* document ensures that learning builds systematically across key stages. Pupils revisit key ideas (e.g., materials, forces, plants, habitats) with increasing depth and complexity. This progression is underpinned by the **Chris Quigley “Great Depth in Science”** framework, which emphasises:

- Mastery through enquiry and reasoning.
- Applying knowledge in new and varied contexts.
- Using scientific language with precision.
- Reflecting on and evaluating evidence.

Teachers use the progression framework to plan sequences of lessons that develop both **substantive knowledge** (scientific facts and concepts) and **disciplinary knowledge** (how science works as a process of enquiry).

Curriculum Enrichment

Science is taught through **practical investigation**, **outdoor learning**, and **cross-curricular links** with mathematics, computing, and geography.

Visits to local environments, such as moorlands, rivers, and woodland habitats, provide opportunities for fieldwork and real-life scientific study.

Pupils are also encouraged to take part in **STEM enrichment activities**, such as Science Week, whole-school investigations, and partnerships with secondary schools or community organisations.

Assessment

Assessment in science is ongoing, purposeful, and designed to track both conceptual understanding and enquiry skills.

- **Formative assessment** takes place during lessons through questioning, observation, discussion, and analysis of pupil work. Teachers assess understanding and adapt teaching accordingly.
- **Summative assessment** is conducted at the end of each topic to evaluate pupils' attainment in both knowledge and working scientifically objectives.
- The **Balance Assessment Tool** is used to record, monitor, and analyse pupil progress across the science curriculum.
 - It tracks pupils' progress in both **substantive knowledge** (key concepts, facts, and vocabulary) and **disciplinary knowledge** (investigative and reasoning skills).
 - This data informs planning, identifies pupils needing further support or challenge, and provides evidence of progression for subject leaders.
 - Termly reviews of Balance data ensure teaching is targeted and curriculum coverage remains consistent across all cycles.

This approach aligns with the *Chris Quigley mastery principles*, ensuring pupils move from *surface learning* to *deep understanding* by applying knowledge flexibly in new contexts.

Impact

By the end of each key stage, pupils at Goathland Primary School will:

- Have secure understanding of key scientific concepts across biology, chemistry, and physics.
- Use appropriate scientific vocabulary to explain and reason about their understanding.
- Demonstrate curiosity and confidence in posing questions and designing investigations.
- Make and justify predictions, collect data accurately, and draw conclusions based on evidence.
- Understand how scientific knowledge impacts everyday life, technology, and the environment.
- See themselves as **scientists** – capable of critical thinking, creative problem-solving, and collaborative enquiry.

The impact of the science curriculum is monitored through:

- **Pupil voice**, demonstrating engagement and enthusiasm.
- **Balance assessment data** and evidence from books and investigations.
- **Teacher moderation** and **subject leader monitoring** to ensure high-quality provision.

By the time pupils leave Goathland Primary School, they will have developed the scientific knowledge, skills, and curiosity needed to succeed in secondary education and to understand and appreciate the science of the world around them.