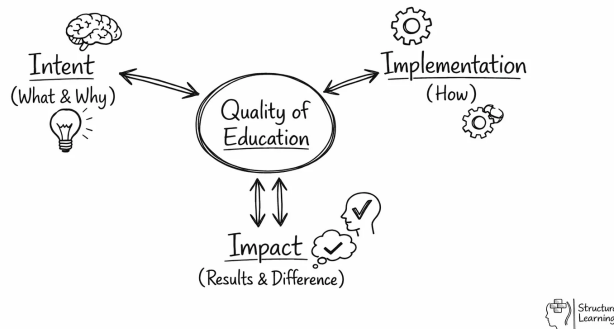


# Broad Oak Science Statement: Intent, Implementation, and Impact

## The 3 I's of Curriculum Design Framework



Our **Intent** for our Science curriculum is designed to ignite curiosity and provide children with the foundations for understanding the world through the specific disciplines of biology, chemistry, and physics.

Guided by our core pillars, our intent is:

- **Memory:** To build a "sticky learning" culture where children consolidate previous knowledge (e.g., identifying garden plants) to master increasingly complex scientific concepts.
- **Resilience & Independence:** To foster a "Growth Mindset" where children embrace the "I can't do it yet" philosophy during experiments, viewing mistakes as essential steps in the scientific method.
- **Imagination:** To provide enriching, hands-on experiences that transcend the classroom, from planting seeds in EYFS to exploring local habitats in Key Stage 1.
- **Vocabulary:** To empower children with subject-specific terminology (e.g., deciduous, omnivore, states of matter) intertwined across all areas of learning.

Our goal is to ensure all pupils develop scientific essential knowledge and are equipped to understand the uses and implications of science today and for the future.

Pedagogical Excellence and Progression -

Implementation is underpinned by a systematic approach to knowledge acquisition, ensuring that the National Curriculum is not just "covered" but deeply embedded within our local context.

### The "Spiral" Journey of Knowledge (Sequencing)

Our curriculum is meticulously mapped to ensure continuity and progression. We leverage our "Sticky Learning" pillar through:

- Spaced Repetition: Units are sequenced so that foundational concepts (e.g., Year 1 Plant Structure) are revisited and expanded upon in later years (e.g., Year 3 Functions and Nutrition).
- Retrieval Practice: Every lesson begins with a "Flashback," challenging children to recall previous learning to strengthen long-term memory.

### "The Broad Oak Scientist" (Disciplinary Knowledge)

We don't just teach Science; we develop Scientists through:

- Working Scientifically: Skills are not taught in isolation. Whether it is Year 1 identifying trees or Year 4 measuring temperatures in °C, practical enquiry is the vehicle for learning substantive facts.
- Technical Oracy: We address the "vocabulary gap" through the explicit teaching of Tier 3 terminology. Science-rich environments and "Working Walls" provide constant visual scaffolds, ensuring children move from everyday language to precise scientific discourse (e.g., from "shaking" to "vibrating").

### Local Context as a "Living Laboratory"

We tailor our curriculum to the unique environment of Penwortham Broad Oak:

- Environmental Utilisation: Our school grounds and the local Penwortham area are used for longitudinal studies, such as

monitoring seasonal changes in local deciduous trees or studying the biodiversity of our immediate habitats.

- Real-World Hooks: We use local industry and environment links to provide "Imagination" opportunities, showing children that Science is not just in a textbook, but happening in the world around them.

### Inclusive Mastery

- Scaffolded Independence: We maintain high expectations for all. Pupils with SEND are supported through adapted resources, visual prompts, and adult modelling, ensuring they access the same ambitious curriculum as their peers.
- "Have a Go" Culture: By praising the process of enquiry rather than just the result, we build the Resilience necessary for children to lead their own investigations and embrace the "I can't do it yet" philosophy.

### Within the Early Years Foundation Stage (EYFS)

- Exploration: Children use all senses to explore natural materials and life cycles (e.g., "Why did the caterpillar get so fat?").
- Health: A strong focus on "Managing Self," including healthy eating, dental hygiene, and physical activity.
- The Natural World: Pupils observe changing seasons and states of matter, recording findings through talk and drawing.

### Within Key Stage 1

- Working Scientifically: Skills such as observing closely, performing simple tests, and identifying/classifying are embedded into every unit.
- Substantive Knowledge:
  - Plants: Identifying wild/garden plants and trees (evergreen/deciduous) using the local school grounds.

- Animals including Humans: Classifying animals (fish, amphibians, reptiles, birds, mammals) by structure and diet (carnivore, herbivore, omnivore).
- Senses: Identifying body parts and their associated senses.

Within Key Stage 2 this is done through:

- Working Scientifically: We implement a curriculum that balances Substantive Knowledge (facts) with Disciplinary Knowledge. Pupils move beyond simple questions to:
  - Using standard units (thermometers/data loggers) for systematic measurements.
  - Recording findings through bar charts, tables, and classification keys.
  - Drawing conclusions and suggesting improvements to their own experimental designs.
- Substantive Knowledge:
  - Plants: Identifying the functions of parts (roots, stems, leaves, flowers) and exploring requirements for life (air, light, water, nutrients).
  - Animals including Humans: Introducing the skeletal and muscular systems for support and protection, alongside the importance of human nutrition.
  - Rocks & Fossils: Comparing physical properties of rocks and understanding the transition from living things to fossils.
  - Light & Forces: Recognising that light is needed to see and exploring the "invisible" nature of magnetic forces and poles.
  - Living Things & Habitats: Using and creating classification keys to group living things in the local and wider environment.

- Environmental Awareness: Recognising that changes to environments (human or natural) can pose dangers to living things.
- States of Matter: Comparing and grouping materials as solids (hold their shape), liquids (form a pool), or gases (escape containers). Observing changes of state when heating or cooling, measuring temperatures in °C. Identifying the roles of evaporation and condensation in the water cycle. Researching extreme state changes, such as iron melting or oxygen condensing, to broaden their subject knowledge.
- Sound: Associating sound with vibrations travelling through a medium to the ear. Finding patterns between pitch/volume and the physical features or strength of the vibrations of the object.
- Electricity: Identifying common appliances that run on electricity and construct simple series circuits using cells, wires, bulbs, switches, and buzzers. Using their independence to try different components (motors, switches) and create simple devices. Recording their findings using pictorial representations of their circuits, preparing the memory for formal symbols.

**Impact** of our Science curriculum is monitored through a variety of lenses to ensure children leave Broad Oak as confident, junior scientists.

- Academic Progress: Children can articulate their ideas in well-formed sentences, using technical vocabulary accurately to explain how and why things happen.
- Scientific Literacy: Pupils can use simple equipment to gather data and suggest answers to their own questions, demonstrating a readiness for the Key Stage 2 curriculum.
- Retention (Sticky Learning): Through regular consolidation, children retain core knowledge of plant structures, animal classifications, and seasonal changes over time.

- Personal Growth: Children demonstrate resilience when experiments don't go as planned and show a deep respect and care for the natural environment and living things.

### Assessment for Impact

- Formative Assessment: Teachers use "in-the-moment" feedback and low-stakes quizzing to identify and close gaps in understanding immediately.
- Summative Evaluation: At the end of each unit, children demonstrate their "sticky learning" through a variety of outcomes, from data-led reports in KS2 to creative diagrams in EYFS.