# NEWTON BLUECOAT CE PRIMARY SCHOOL

# SCIENCE CURRICULUM

## Whole-School Overview 2026-27

**QUESTION • INVESTIGATE • OBSERVE • EXPLAIN • DISCOVER**

***"Shine from the inside out"***

Nurturing curious, knowledgeable and evidence-minded young scientists.

## Our Science Vision

**At Newton Bluecoat, science begins with curiosity about the world.** We want children to ask questions, build secure scientific knowledge and use evidence to explain what they observe. Practical enquiry is woven through substantive knowledge so pupils learn both what we know and how scientific ideas are tested, refined and communicated.

**Our curriculum deliberately revisits powerful ideas across biology, chemistry and physics.** Children encounter plants and animals, materials, habitats, light, sound, electricity, forces, Earth and space, evolution and health at increasing depth, while Working Scientifically develops from supported observation and simple tests to increasingly independent enquiry, control of variables and evaluation of evidence.

### By the end of Year 6, our scientists will…

- ask increasingly precise scientific questions and choose appropriate ways to investigate them;
- plan and carry out comparative and fair tests, recognising and controlling variables where necessary;
- observe and measure accurately, selecting appropriate equipment and taking repeat readings when useful;
- record, present and interpret data using tables, diagrams, classification keys and appropriate graphs;
- draw conclusions from evidence, identify patterns and causal relationships, and evaluate the trustworthiness of results;
- use secure knowledge of living things, the human body, materials, forces, light, electricity, Earth and space, and evolution to explain phenomena;
- use scientific vocabulary accurately when speaking and writing;
- recognise that scientific ideas can change in response to new evidence;
- know about the contribution of scientists including Mary Anning, Galileo Galilei, Isaac Newton, Charles Darwin and Alfred Russel Wallace;
- approach the natural world with curiosity, care and a desire to find out more.

### The Scientific Enquiry Cycle

| QUESTION | PREDICT | PLAN | OBSERVE | INTERPRET | EVALUATE |
|---|---|---|---|---|---|
| What do we want to know? | What do we think and why? | How will we find out? | Measure and record | What does the evidence show? | How strong is our evidence? |

# Whole-School Science Journey

| Year | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| **Year 1** | The Human Body | Everyday Materials | Animals | Caring for the Planet | Plants | Growing and cooking |
| **Year 2** | — | Health: Animals incl. Humans | Uses of Everyday Materials | Plants: Growing plants | Living Things & Habitats | Animals incl. Humans: survival & growth |
| **Year 3** | Light & Astronomy | Health: Animals incl. Humans | Forces & Magnets | Rocks | Animals incl. Humans: skeletons & movement | Plants: functions & growth |
| **Year 4** | Electricity | Sound | Animals incl. Humans: Teeth & Digestion | Animals incl. Humans: Teeth & Digestion | States of Matter | Living Things & Habitats |
| **Year 5** | Properties & Changes: testing | Properties & Changes: material changes | Properties & Changes: reversible / irreversible | Earth & Space | Forces | Living Things & Habitats |
| **Year 6** | Evolution & Inheritance | Light | Living Things & Habitats: classification | Electricity | Animals incl. Humans: circulation & exercise | Health: diet & lifestyle |

## Learning Across the Year

- Year 1 observes plants and seasonal changes throughout the year, including sunlight and weather links.
- Year 2 observes plants and animals in the local environment throughout the year.
- Year 4 uses the local environment throughout the year to identify, study and observe changes in plants and animals in their habitats.
- Year 5 observes life cycles of plants and animals in the local environment throughout the year; human life cycles are linked with PSHE as identified in the existing overview.

**SCIENCE IS NOT ONLY A BODY OF KNOWLEDGE - IT IS A WAY OF ASKING QUESTIONS AND USING EVIDENCE.**

# Progression in Working Scientifically

| Strand | KS1 | Lower KS2 | Upper KS2 |
|---|---|---|---|
| **Questions & enquiry** | Ask simple questions; recognise different ways to answer them. | Ask relevant questions; select enquiry approaches and use secondary sources appropriately. | Ask scientific questions independently; choose and justify enquiry types; plan investigations and control variables. |
| **Observation & measurement** | Observe closely using senses and simple equipment; begin to measure. | Make systematic observations and use standard units and a wider range of equipment. | Select equipment for precision; take increasingly accurate measurements and repeat readings where appropriate. |
| **Testing** | Perform simple tests, comparisons, classification, pattern seeking and observations over time. | Set up practical enquiries, comparative tests and simple fair tests. | Plan comparative and fair tests; recognise/control variables and make decisions about samples and duration. |
| **Recording & data** | Use drawings, photos, simple tables, pictograms, tally charts and block graphs. | Record with scientific diagrams, tables, bar charts and classification approaches. | Choose how to record/present evidence using tables, classification keys, bar/line/scatter graphs and other appropriate forms. |
| **Evidence & conclusions** | Use observations and ideas to suggest answers. | Use evidence to answer questions, identify similarities/differences/patterns and draw simple conclusions. | Explain patterns and causal relationships; identify anomalous results; evaluate methods, accuracy, precision, sources and degree of trust. |
| **Communicating** | Talk about what happened using developing scientific language. | Report findings orally and in writing using appropriate scientific vocabulary. | Communicate findings clearly for an audience and explain how evidence supports or refutes ideas. |

## Five Enquiry Approaches

- observing over time;
- pattern seeking;
- identifying, classifying and grouping;
- comparative and fair testing;
- research using secondary sources.

## Thinking Like a Scientist

What do I notice? • What do I already know? • What is my question? • What evidence will I need? • Which variables matter? • Is there a pattern? • Does the evidence support my idea? • How confident am I in the result? • What should I investigate next?

# Big Ideas That Build Across Science

| Knowledge thread | How understanding develops |
|---|---|
| **Living things & habitats** | Animals and plants → survival and habitats → classification and environmental change → life cycles and reproduction → classification at greater depth → adaptation and evolution. |
| **Plants** | Names and structures → seeds/bulbs and conditions for growth → functions of plant parts, pollination and seed dispersal. |
| **Animals including humans** | Body parts and senses → growth, health and survival → nutrition, skeletons and movement → teeth and digestion → human life cycles → circulation, exercise, diet and lifestyle. |
| **Materials** | Everyday materials and properties → uses and suitability → states of matter → testing properties, dissolving, separation, reversible and irreversible changes. |
| **Forces** | Everyday pushes/pulls → forces and magnets → friction, air resistance and mechanisms. |
| **Light, sound & space** | Seasonal/light observations → shadows and reflective surfaces → sound → Earth and space → Year 6 light. |
| **Electricity** | Build and explore circuits → components and control → more complex circuits, symbols and effects of changes. |

## Scientists in the Existing Curriculum

**Year 3:** Mary Anning

**Year 5:** Galileo Galilei and Isaac Newton

**Year 6:** Charles Darwin, Alfred Russel Wallace and Mary Anning

## Local Environment as a Scientific Resource

The existing curriculum makes purposeful use of the local environment for longitudinal observation. Pupils revisit plants, animals, habitats, seasonal change and life cycles across the year, allowing them to notice change over time rather than experiencing science only as isolated blocks.

# Scientific Language & Knowledge

**Vocabulary is taught as part of understanding, not as a disconnected list.** Pupils repeatedly hear, say, read and write precise scientific terms and use them to explain observations, compare evidence and communicate conclusions.

| Phase | Examples of core scientific vocabulary |
|---|---|
| **KS1** | observe, question, test, compare, classify, identify, material, property, plant, seed, root, stem, leaf, animal, habitat, healthy, senses, season |
| **Lower KS2** | enquiry, evidence, measurement, standard unit, fair test, pattern, variable, prediction, conclusion, force, magnet, reflection, sound, vibration, circuit, conductor, insulator, digestion, skeleton, nutrient, state of matter |
| **Upper KS2** | accuracy, precision, repeat reading, sample, causal relationship, anomaly, reliability, credibility, classification key, reversible, irreversible, dissolve, solution, friction, air resistance, orbit, adaptation, inheritance, evolution, circulation |

## Making Knowledge Stick

- Begin units by activating relevant prior knowledge and identifying misconceptions.
- Revisit key concepts and vocabulary through retrieval, talk, practical work and application in new contexts.
- Connect Working Scientifically to the substantive knowledge being taught so enquiry has a clear scientific purpose.
- Use models, diagrams, demonstrations and first-hand experiences to make abstract ideas accessible.
- Return to longitudinal studies across seasons and the local environment so pupils experience real change over time.

## A Typical Science Learning Sequence

- RETRIEVE - recall the knowledge and vocabulary that will help with today's learning.
- QUESTION - identify the scientific idea or enquiry question.
- EXPLORE - observe, investigate, research or model the phenomenon.
- EXPLAIN - use scientific knowledge and vocabulary to make sense of the evidence.
- APPLY - use learning in a new example, prediction or problem.
- REFLECT - evaluate the evidence, method and what we now understand.

# Implementation

- Science is taught through the agreed whole-school sequence, preserving the substantive content and year-group allocation in Newton Bluecoat's current curriculum overview.
- Working Scientifically is taught through science content rather than as a separate bolt-on. Enquiry choices are matched to the question and the knowledge pupils are developing.
- Teachers explicitly model scientific vocabulary, questioning, observation, measurement, recording, interpretation and explanation before expecting increasing independence.
- Practical work is purposeful: pupils know what scientific idea they are investigating and what evidence will help them answer the question.
- The local environment is used for repeated observation of plants, animals, habitats, seasonal change and life cycles.
- Assessment is primarily formative: questioning, retrieval, pupil explanations, practical outcomes, diagrams, data and written conclusions reveal what pupils know and can apply.
- Teachers revisit misconceptions and prior learning so that pupils build connected scientific understanding rather than isolated facts.
- Scientists and the development of scientific ideas are used to show that knowledge is built through observation, evidence, debate and new discoveries.

# Impact: What Will We See?

- Pupils are curious and ask increasingly purposeful scientific questions.
- Children remember and connect important scientific knowledge across year groups and topics.
- Pupils use scientific vocabulary accurately to explain ideas and phenomena.
- Practical work becomes increasingly independent, precise and purposeful.
- Children can select and present evidence, identify patterns and draw conclusions that are consistent with their results.
- Older pupils can discuss variables, accuracy, precision, anomalies, reliability and the degree of trust they place in evidence.
- Pupils understand that scientific ideas may change when new evidence becomes available.
- Children can talk about scientists studied in the curriculum and how their work contributed to scientific understanding.

## Subject Leadership & Monitoring

The Science subject leader monitors curriculum implementation and impact through planning and curriculum scrutiny, pupil voice, lesson visits/learning walks, book and work scrutiny, discussion with teachers and review of assessment information. Monitoring considers whether substantive knowledge and vocabulary build progressively, whether Working Scientifically is embedded purposefully, whether pupils retain and connect prior learning, and whether all pupils have equitable access to practical, investigative and language-rich science.

**CURIOUS MINDS • SECURE KNOWLEDGE • CAREFUL ENQUIRY • EVIDENCE-BASED EXPLANATIONS**