A GUIDE TO SCIENCE AT LONGMOOR

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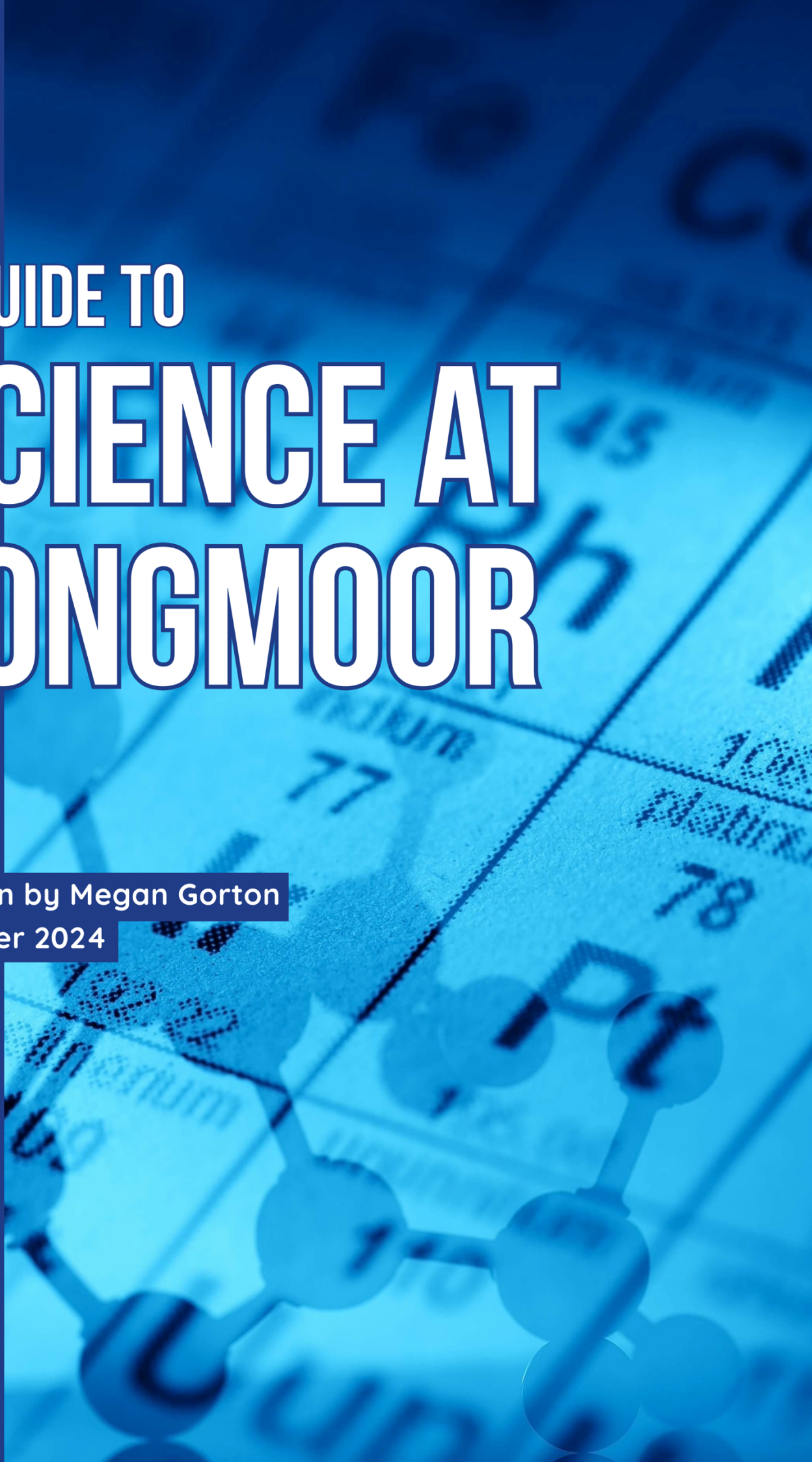

Longmoor
Community Primary School

Vision

Our Science curriculum aims to ensure that children gain a high-quality education which provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Our children will be able to understand how science has changed our lives and its vital role to the world's future prosperity.

We seek to develop a sense of excitement and curiosity about natural phenomena and encourage children to recognise the power of rational explanation. Our children will be able to ask scientific questions, explore different methods of science, share predictions on how things will behave and analyse causes.

Curriculum Design

Longmoor's Science curriculum has been designed to provide a comprehensive understanding of science by focusing on scientific enquiry, fostering curiosity and critical thinking as well as using hands-on experiences to support the exploration of scientific concepts.

'Vertical' Studies

We have designed a curriculum that provides opportunities for areas of study to be revisited vertically (ie. in different year groups), through the teaching of different areas of scientific investigation.

We have defined these as:

- Animals including Humans
- Living things and their habitats
- Plants
- Evolution and Inheritance
- Materials
- Seasonal Changes
- Rocks
- States of Matter
- Earth and Space
- Light
- Forces
- Electricity
- Sound

There are opportunities for all pupils to see themselves reflected in the curriculum, but also to be taken beyond their own experiences. The curriculum teaches pupils about a variety of scientific explorations and incorporates both the strengths and challenges faced throughout investigations.

We have ensured that there is a grounding in core disciplinary (thinking like a scientist) and procedural (knowing how to) knowledge, giving pupils the ability to learn how to think, explore and record like a scientist.

Scientific Enquiry Skills

- Asking questions
- Making predictions
- Setting up tasks
- Observing and measuring
- Recording data, results and findings
- Interpreting and communicating results
- Comparative / Fair testing
- Research
- Pattern seeking
- Observations over time
- Identifying, grouping and classifying
- Problem-solving

We have chosen one scheme of learning at our school (Developing Experts) which is used from Early Years all the way through to Year 6. This is because the scheme provides clear progression of skills, ensuring that our pupils have a deep and cohesive understanding of science.

When adapting this scheme of learning, we have carefully ensured that knowledge is progressive and builds upon prior learning so that children are ready for the next stage of learning when they reach the end of each academic year.

Teaching Pedagogy

Our curriculum for science has been very carefully sequenced to ensure coverage and progression through disciplinary and procedural knowledge. The order of teaching and learning is never changed due to how intrinsically it has been planned to ensure this progression.

Each unit clearly defines the knowledge that should be taught and reviewed in the sequence of lessons. Teachers must ensure that content is taught in the order provided, filling gaps and addressing misconceptions as required.

In the Early Years, teaching is focused on hands-on experiences and building new knowledge and vocabulary. Although building knowledge and vocabulary is important at all stages, it is especially important in the early years as the gaps are still relatively small and the odds of catching up are better, which is why there is a focus on this throughout our scheme and progression of learning. The hands on-experience that occurs within the early years of learning gives the children the opportunity to be exposed to scientific enquiry skills and begin to understand how to develop these.

This is built upon in Key Stage One; there are clear opportunities for vocabulary to be taught and revisited, followed by opportunities for the children to use these collaboratively. Scientific enquiry skills are also developed when the children are tasked with various investigations, starting to form their own predictions and evaluations of what they think will happen.

As the children progress into Key Stage Two, there are clear opportunities gain for modelled, guided and independent development of scientific enquiry skills. This takes the form of 'Rocket Questions, Rocket Words' and explicit teaching from high-quality material. Teachers expertly use the Rocket Questions to stimulate discussion and scientific exploration to impart knowledge.

Vocabulary is explicitly taught throughout the Science curriculum; our children know that these scientific terms are an integral part of learning, and become versed in their meaning and use. The children have various opportunities to practise the vocabulary throughout the lesson, including using it in context. These are known as 'Rocket Words' and they are displayed on working walls once taught and understood by pupils, and pupils are expected to use them in their independent practice (which may look different depending on the age and stage of the child).

Subject Specific Adaptations

A key goal of our Science curriculum is to bring all pupils into the conversation of the lesson and into the knowledge that is being disseminated. We do not exclude pupils from learning and therefore there is little, if any, 'differentiation' by curricular input; all pupils will encounter expert films, repeat the vocabulary and participate in scientific exploration together.

We recognise however that for some pupils, because of severely limited prior knowledge or specific barriers, extra time and help to access materials may be necessary:

- Building knowledge through oral work: our aim is for pupils to be familiar with scientific vocabulary aurally and orally.
- Pre-teaching of content or specific vocabulary before moving onto reading the high-quality text (applies to all children): we check that particular pupils have understood this vocabulary through small amounts of information followed by reinforcement and retrieval.
- Prioritising attention to lower-attaining pupils or pupils with SEND when teaching core scientific vocabulary: these pupils take part in choral response and are quizzed when revisiting.
- Simple adaptations to learning materials: simple annotation of a diagram using pictures, matching pictures to definitions, drawing/labelling an experiment.

Assessment

It is recognised that assessment of pupils' learning and understanding is only useful if it informs future practice, is used to address misconceptions or is used to address understanding of key

concepts. Therefore, assessment in Science is most useful at the point of teaching and learning, so that immediate actions can be taken.

There are specific assessment techniques that are used in Science at our school, some of which are school-wide (rather than within the subject itself) and others that are specific to the teaching of Science at either Key Stage One or Key Stage Two.

The careful sequencing of the curriculum – and how concepts are gradually built over time – is our progression model (although we have set out progression in concepts and knowledge in a separate document). If pupils are 'keeping up' with the curriculum, they are making progress.

Examples of further formative assessment in Science include:

- Questioning in lessons: teachers check understanding so they can fill gaps and address misconceptions as required.
- Pupil conferencing with books: the subject leader and SLT talk to pupils about what they have learned – both disciplinary and procedural – and how this connects to the scientific enquiry skills that they have been developing in previous units and previous years.
- Assessment of how experiments are undertaken (scientific enquiry skills), and scaffolding these if this needs to happen.
- Assessment of children's understanding of scientific vocabulary.
- Post-learning quizzes at the end of each lesson and the beginning of the next (where appropriate) to recap knowledge and ensure it is embedded.

Overview of the Taught Units in Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
N	Body & Senses	Materials	Weather & Seasons	Animals	Plants	Food
R	Body & Senses	Materials	Weather & Seasons	Animals	Plants	Space & Forces
1	Animals, Including Humans All About Animals	Seasonal Changes	Everyday Materials Exploring Everyday Materials	Everyday Materials Building	Plants	Animals, Including Humans All About Me
2	Animals, Including Humans Growth	Living Things and Their Habitats	Living Things and Their Habitats (Habitats from Around the World)	Uses of Everyday Materials	Animals, Including Humans Life cycles	Plants
3	Plants	Scientific Enquiry	Animals, Including Humans	Rocks	Forces and Magnets	Light
4	Animals, Including Humans (The Digestive System, Food Chains and Webs)	Electricity	Living Things and Their Habitats	Living Things and Their Habitats (Conservation)	States of Matter	Sound
5	Properties of Materials	Forces	Changes in Materials	Animals, Including Humans	Earth & Space	Living Things and their Habitats
6	Animals, Including Humans	Light	Electricity	Living Things and their Habitats	Evolution and Inheritance	Looking After the Environment

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