Science – Intent

Our Vision

"Hope: building for a brighter future"

The study of science provides a vital tool for analysing and understanding the world around us. Our children are growing up in a world where they will need to be able to critically evaluate and ask and answer questions. Our science is enquiry-focussed and lessons will allow children to develop the key skills of questioning, observing, analysing, concluding and evaluating. All key subject knowledge is rigorously taught, but children are encouraged to ask and answer their own questions too.

Our science lessons are very much focussed on learning through doing, and key subject knowledge is taught, repeated and reinforced in a practical, 'hands-on' way wherever possible.

We seek to foster a spirit of excitement and curiosity about the world around us. The news is full of gloomy predictions about our planet's future but we want our children to see the future with hope; and to see what science can allow us to do, to overcome the challenges that lie ahead.

Curriculum Aims

At North Star, we aim to:

- Equip all our children with the fundamental skills of enquiry and critical thinking that are needed to be successful throughout their lives, including:
- Develop children's ability to explore, ask questions, plan how to answer those questions, and to make sense of their observations – including being able to answer the questions that they initially asked.
- Equip the children with all the subject knowledge they need to be successful, first at High school and then into the rest of their lives.
- Ensure our children have all the key knowledge they will need for any future science-based career.
- Ignite a passion for STEM based subjects, that at least some will carry with them through the rest of their lives and hopefully guide their choice of careers.
- Ensure that all subject knowledge is covered well, regardless of the class split, and that 'new' knowledge builds on that previously learnt.
- Prioritise quality first teaching for all, adapting curriculum content and lessons plans as necessary to ensure progress and fulfilment for all children.
- Promote a love of science

Values

Christian: compassion, kindness & respect **Learning**: curiosity, ambition, trust & perseverance

Through working collaboratively to investigate, the children will develop their values of compassion, kindness and respect – working together to plan, carry out and analyse investigations and other group activities. Practical science does not always go exactly as planned, giving children chance to develop their resilience and perseverance skills! Since much of science involves critical thinking, children will have ample opportunity to develop their values of learning what can be trusted, and how we know if something is trustworthy. Alongside this, curiosity is the main-stay value of science and so, in most lessons, children will be developing this.

Science – Implementation

At North Star, we follow the curriculum structure of CUSP (Curriculum with Unity Schools Partnership), which draws on academic research and incorporates Rosenshine's Principles of Instruction (see Curriculum Policy). We add to this a focus on time to 'explore' within the topic being studied, and ensure learning is as practical as possible, but always in ways that will enhance children's knowledge and understanding.

Long-term planning

All National Curriculum subject knowledge is broken down by topic and year group and long-term planning ensures that, however classes are split, all children will cover all subject knowledge at least once. Most areas of study are re-visited. In every case, science lessons build upon the children's prior knowledge and learning – even where topics are covered in a different order due to having split year groups.

Enquiry skills and investigation planning builds across year groups with increasing levels of independence expected and supported. These skills are explicitly taught alongside the key subject knowledge. This planning aims to create independent-thinking Scientists in our children.

Phases of a lesson

- 'Connect' – making connections with prior learning so children can build their learning on solid foundations.
- 'Explain' – new material (including high-quality vocabulary) is introduced in small steps to support the effectiveness of the working memory and avoid cognitive overload (small steps).
- 'Example' – teaching staff clearly model how to do undertake the task/ carry out the experiment so that children know clearly what they are expected to do, and what they should be looking out for.
- 'Attempt' – teaching staff guide pupils through the beginning of the task, using purposeful questioning and effective examples to address misunderstandings.
- 'Apply' – purposeful, independent practice reduces the load on the working memory while still achieving a high success rate. This is often completion of a practical task.
- 'Challenge' – all children are given the opportunity to deepen their knowledge and understanding of new content by applying it in a different way.

Spiritual development

Through science at North Star, we encourage everyone to be amazed at the world around and how intricate and interlinked its systems are. We discover the natural world, the human body, and physics. Awe and wonder have a key place in science, as we ask and answer questions and explore the amazing world we all live in.

Inclusion/support for all

High-quality modelling enables all children to see and understand exactly what is expected of them in each lesson. Recording methods other than just writing are used, to enable all children to enjoy and fully engage in *science* and reducing any obstacle around reading and writing. Resources are dual-coded and careful choices within group work allows children to be supported and achieve as part of a group, learning with and from their peers. Knowledge Notes are used and referred in most lessons, to reduce the cognitive load. All activities are carefully planned, resourced and supported to allow all children to succeed.

Science – Impact

Pupils

At the end of each science unit, children will be teacher assessed for their learning against the National Curriculum statements for subject knowledge in that unit. This will be based on their work and on teacher observations during lessons, group work and contributions to class discussions. Pupils will be assessed as 'working towards', 'expected' or 'above expected' and teachers will take account of any lessons missed.

Teachers

Teachers are responsible for assessing their classes in each Science unit that is taught. This information will be fed to the subject leader and to the school's SLT. This information will be used to feed into planning and identifying areas of further support, as well as curriculum development.

Subject leader

North Star's subject leader(s) has first responsibility for monitoring the quality of teaching and learning, and for making and enacting plans to improve the same. They do this in various ways, typically with a specific focus for the monitoring activity:

- **Learning walks/lesson drop ins** – short observations of lessons
- **Book looks** – reviewing a sample of books/work from across the school
- **Collecting pupil voice** – speaking to a cross-section of children about their learning
- **Professional discussions with staff** – formally and informally, through reporting and check-in chats
- **Keeping a check on equipment and resources** – speaking to colleagues and sourcing new materials that will support the practical teaching of subject knowledge

The subject leader also reports to governors.

Governors

Federation governors play an important role in receiving reports from subject and school leaders, visiting school to observe the experiences of our children and holding school leaders to account on their school improvement planning and the quality of education in our Federation.

Statutory assessment

Teacher Assessment of children in science will be reported to parents at the end of Year 6, when the SATs results are reported.