Science Rationale

Intent:

At Eastfield, we aim to deliver a high-quality, ambitious Science curriculum that inspires curiosity and enables children to make sense of the natural and physical world. Through the STEM Learning Solutions Ltd (SLS) Primary Science Curriculum, pupils build secure substantive knowledge alongside the disciplinary knowledge and skills required to work and think scientifically. Children learn to ask worthwhile questions, investigate systematically, evaluate evidence and communicate increasingly precise scientific explanations.

Knowledge of:

- Scientific knowledge across biology, chemistry and physics, including plants; animals, including humans; living things and habitats; evolution and inheritance; materials; rocks; states of matter; light; sound; electricity; forces; seasonal change; and Earth and Space.
- Scientific vocabulary and models that help pupils describe, connect and explain ideas.
- Working Scientifically through a progressive range of enquiry types.

Understanding of:

- Explaining science using recalled and connected knowledge
- Identifying, grouping, classifying and using keys
- Asking questions, predicting and designing investigations
- Selecting equipment and managing risk
- Observing, measuring and recording accurately
- Using data, tables, charts and graphs
- Identifying patterns, drawing conclusions and evaluating reliability

Our curriculum is carefully sequenced from Early Years to Year 6 so that scientific knowledge, vocabulary and Working Scientifically skills are revisited and developed over time. Dual objectives ensure that pupils learn both important scientific content and how scientists observe, classify, design enquiries, use data and draw conclusions. Learning develops from exploring and noticing to explaining, evaluating and reasoning scientifically.

Science reflects Eastfield's drivers of Pride, Collaboration and Understanding. Pupils take pride in careful practical work, collaborate to discuss ideas and evaluate evidence, and build connected knowledge that helps them explain how and why things happen. They also learn how science relates to everyday life, current and future scientific debates, technology and STEM-related careers.

Science is an active, knowledge-rich and investigative subject that encourages children to consider fundamental questions:

- What is happening, and how can science explain it?
- How can it be observed, compared, grouped or classified?
- What happens when a variable is changed?
- How does this knowledge connect to everyday life and the wider curriculum?
- How and why are scientific ideas, evidence and models connected?

Implementation:

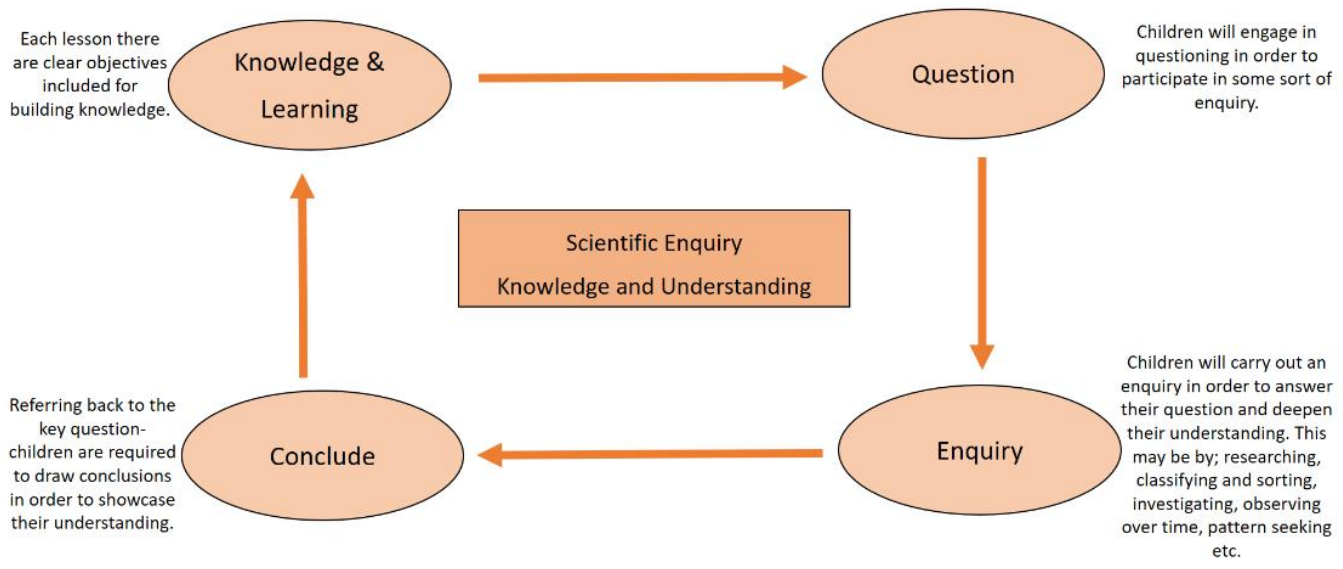
Curriculum Organisation:

The long-term plan is organised through the SLS Primary Science Curriculum so that National Curriculum content is taught through a coherent sequence of units from Early Years to Year 6. Substantive knowledge, scientific vocabulary, enquiry types and Working Scientifically skills are mapped progressively, enabling teachers to build securely on prior learning and prepare pupils for their next stage.

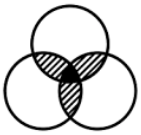
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Geography	History	History	Geography	Art & Design	D&T
Early Years	*I will learn to be a Geographer* **Floating and Sinking**	*I will learn to be an Historian:* ***Significant Individuals*** **The Moon** **The Seasons (Autumn)**	*I will learn to be an Historian:* ***Significant Event*** **Changing States** **The Seasons (Winter)**	*I will learn to be a Geographer* **Properties of materials** **The Seasnons (Spring)**	*I will learn to be an Artist* **Plants**	*I will learn to be a Designer* **Animal life cycles** **The Seasons (Summer)**
Y1 Science Coverage	**Physical:** How is London connected to the UK **Seasonal changes**	***Significant Individuals:*** Explosion & Fire: Guy Fawkes & Samuel Pepys **Everyday materials**	***Changes in living memory:*** School, Toys & Transport **Animals inc Humans (Winter- seasonal changes)**	**Human:** Why are Immingham & Cleethorpes significant? **Animals inc Humans continued**	***Africa:*** Sculpture - junk modelling **Plants**	***Africa:*** Textiles **Summer- Seasonal Changes**
Y2 Science Coverage	**Physical:** What makes continents hot or cold? How do coastlines change? **Everyday materials**	***Significant Individuals:*** Exploration: Grace Darling, Grace O'Malley & Christopher Columbus	***Significant Individuals & Local History:*** The Pilgrim Fathers **Animals including humans**	**Human:** What is the significance of Boston, Massachusetts?	***North America:*** Painting - acrylic **Plants**	***North America:*** Food Technology **Living things and their habitats**
Y3 Science Coverage	**Physical:** What are the features of a water course? ***Rocks***	***British History:*** The Stone Age **Forces and Magnets**	***British History:*** From the Stone Age to the Iron Age ***Light***	**Human:** Shall we take a trip to Kielder? **Plants**	**Australia:** Aboriginal Art- Painting **Animals inc Humans**	**Australia:** Bridges- Structures
Y4 Science Coverage	**Physical:** Why is the 'Ring of Fire' significant? **States of Matter**	***British History:*** The Roman Empire & its impact on Britain **Living things and their habitats**	***British History:*** The Viking & Anglo-Saxon Struggle **Electricity**	**Human:** Why is Italy a Mediterranean country? **Animal including humans**	**Europe:** Painting - water colour/acrylic) **Sound**	**Europe:** T-shrits Textiles
Y5 Science Coverage	**Physical:** Do rainforests have layers? **Living things & their habitats**	***Non-European:*** The Mayans **Animals, inc humans**	***Earliest Civilisation:*** Ancient Egypt **Properties and changes of materials**	**Human:** Where is Mexico? **Properties and changes of materials**	**South America:** Painting - poster/acrylic **Earth & Space**	**South America:** Electrical Systems **Forces**
Y6 Science Coverage	**Physical:** Journey to Antarctica? **Living things & their Habitats**	***Earliest Civilisation:*** Ancient Greece - influence on the western world **Animals, inc humans**	***British History:*** World War II **Light**	**Human:** Where should I emigrate to? **Evolution and inheritance**	**Asia:** Sketching & Pastels **Electricity**	**Asia:** Mechanical Systems

Pedagogy:

Each unit has a clear teaching sequence and dual objectives: one for scientific knowledge and one for Working Scientifically. Lessons combine explicit teaching with practical investigation, observation, discussion, research and problem-solving. Retrieval practice strengthens long-term memory and connects new learning with prior knowledge. Oracy enables pupils to explain, justify and refine ideas using precise scientific vocabulary, while metacognitive strategies help them plan approaches, monitor progress and evaluate findings. Responsibility is gradually released so that pupils become increasingly independent scientists.



Working Scientifically is taught explicitly and progressively through six complementary enquiry types:

	**Comparative and fair testing -** changing one variable and observing or measuring its effect while controlling other variables where appropriate.
	**Researching and communicating -** using reliable secondary sources to find, select, organise and communicate relevant scientific information.
	**Observing and measuring over time -** observing and recording changes over periods ranging from seconds or minutes to days or months.
	**Finding patterns -** using observations and data to identify patterns, trends and relationships.
	**Identifying and classifying -** sorting, grouping and identifying living things, materials or phenomena using appropriate criteria and keys.
	Problem-solving and applying scientific knowledge - using scientific knowledge, evidence and models to answer questions and solve unfamiliar problems.

Developing 'Scientists:

To develop confident and independent scientists, staff ensure that each sequence of learning includes:

- *Secure, connected substantive knowledge, explicit vocabulary and the progressive use of scientific models.*
- *Focused development of Working Scientifically skills through varied enquiry types, practical experiences and appropriate scientific equipment.*
- *Opportunities to question, discuss, investigate, collaborate, reason from evidence and communicate increasingly logical explanations.*

The curriculum supports depth, challenge and connection. Formative assessment and effective questioning identify misconceptions quickly, while adaptive teaching maintains ambitious outcomes for all. Pupils are prepared for secondary science and equipped with the scientific literacy and Science Capital needed to understand the uses and implications of science and engage with future opportunities and debates.

Impact:

At the Leadership Level:

Science has a clear monitoring cycle that consists of 3 clear foci across three consecutive half terms:

1. **Development Focus Input** – identifying the work that needs to be conducted *e.g. pupil voice, staff voice, enquiry, classroom walk through, enquiry into books, planning alignment, learning environment evidence, data etc.*
2. **Development Activity** - focused improvement work *e.g. CPD, staff coaching/mentoring, purchase of resources etc.*
3. **Development Moderation** – impact of leadership work *e.g. pupil voice, staff voice, enquiry, classroom walk through, enquiry into books, planning alignment, learning environment evidence, data etc.*

Science has an identified Subject Lead and is part of the Culture Team; staff work in teams to identify, lead and monitor the development of the curriculum across the school. This work is cyclic and builds on areas identified for development. Timely feedback is given to staff after any monitoring and the Subject Lead writes an annual causal chain to outline work undertaken and the impact they have had on the teaching and learning of science across the school.

At Classroom Level:

The impact of the curriculum is assessed through pupils' developing scientific knowledge and their ability to apply Working Scientifically skills. Teachers use questioning, retrieval, observation, discussion, written outcomes, practical tasks and pupils' use of data to identify what has been understood and any misconceptions. Assessment is matched to the SLS progression in Explaining Science, Classification, Designing Experiments, Data, Tables and Graphs, and Making Conclusions.

Teachers use ongoing formative assessment and record summative judgements to identify whether pupils are working towards, meeting or exceeding age-related expectations. This information is analysed by the Subject Lead to identify strengths, gaps and priorities for curriculum development.

Science Subject Lead: Kylie Watson