

**Intent:**

At Eastfield we aim to deliver a high-quality Science curriculum that will help our children to develop thorough understanding of the world around us. At Eastfield, science is about enabling our pupils to experience and observe phenomena in the natural and humanly-constructed world. Our children should be encouraged to be curious and ask questions about what they notice and observe and should be helped to develop their scientific ideas by using different types of enquiry to answer their own questions.

***Knowledge of:***

- Working scientifically by constructing fair tests and understanding independent and dependent variables.
- Plants; Animals, including humans; Living things and their habitats and Evolution and Inheritance
- Materials; Rocks; Light; Forces and Magnets; States of Matter; Sound; Electricity; Forces and Light
- Seasonal Changes
- Earth and Space.

***Understanding of:***

- Identification
- Relationships
- Sorting, classifying & grouping
- Comparisons
- Hypothesising
- Cause & Effect
- Explore and question
- Recording & representing data

We want to inspire children's curiosity to know more about scientific phenomena through a progressive approach set out in the National Curriculum. This approach provides opportunities to teach our children to build on previous learning and deepen their understanding and question the scientific processes that surround them in their every day lives.

Through the wider curriculum offer, our children will understand the complexity of the 'here and now' of real life and as such, is a vital 'living' subject that contributes to and enhances the wider curriculum.

Science is an enquiry led subject that seeks answers to fundamental questions:

- What is happening? (and why?)
- What is it like? (and why?)
- What if I change different variables?
- What is the link to real life?
- How and why are concepts connected?

## Implementation:

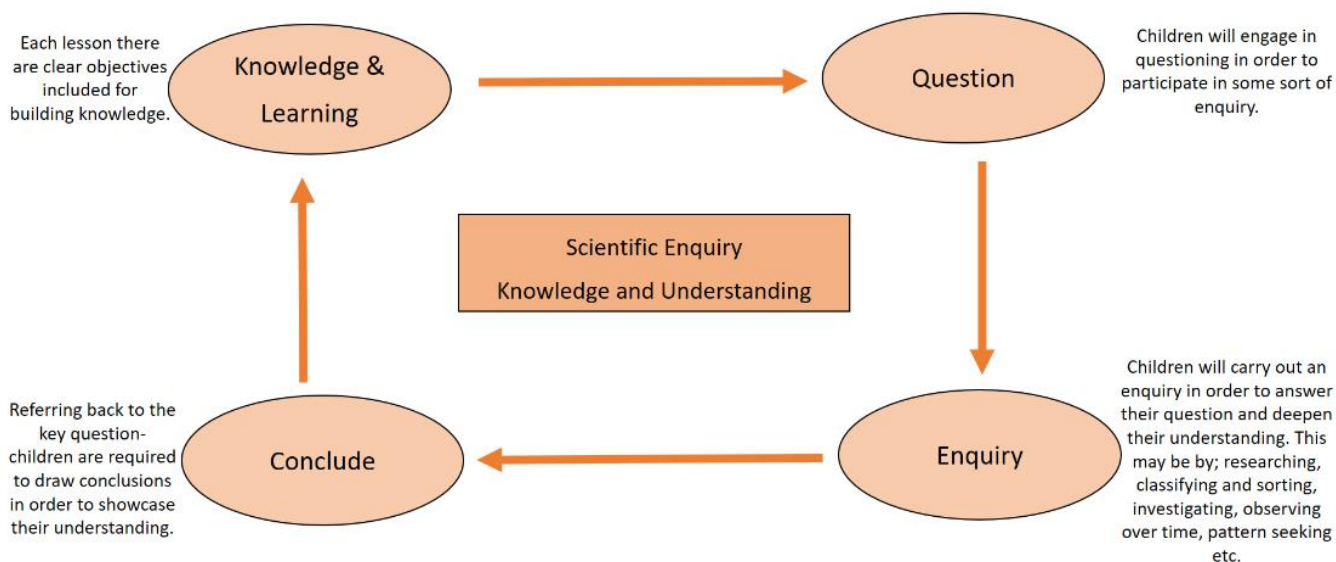
### Curriculum Organisation:

The Long Term Plan is organised so that a science unit plan is delivered per half term and this is to be decided at the classroom level, ensuring all the unit plans are delivered across the year.





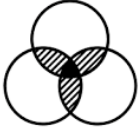
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Geography	History	History	Geography	Art & Design	D&T
<b>Early Years</b>	I will learn to be a Geographer  Floating and Sinking	I will learn to be an Historian: Significant Individuals  The Moon The Seasons (Autumn)	I will learn to be an Historian: Significant Event  Changing States The Seasons (Winter)	I will learn to be a Geographer  Properties of materials The Seasons (Spring)	I will learn to be an Artist  Plants	I will learn to be a Designer  Animal life cycles The Seasons (Summer)
<b>Y1</b> <b>Science Coverage</b>	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
<b>Y2</b> <b>Science Coverage</b>	Physical: What makes continents hot or cold? How do coastlines change?  Everyday materials	Significant Individuals: Exploration: Grace Darling, Grace O'Malley & Christopher Columbus  Everyday materials	Significant Individuals & Local History: The Pilgrim Fathers  Animals including humans	Human: What is the significance of Boston, Massachusetts?  Plants	North America: Painting - acrylic  Plants	North America: Food Technology  Living things and their habitats
<b>Y3</b> <b>Science Coverage</b>	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
<b>Y4</b> <b>Science Coverage</b>	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-shirts Textiles
<b>Y5</b> <b>Science Coverage</b>	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
<b>Y6</b> <b>Science Coverage</b>	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 of work has a clear teaching sequence, a Unit Plan. Each lesson will have 4 key aspects; knowledge and learning, questioning, enquiry and concluding. Sometimes the lesson will start with providing children knowledge, but sometimes it will start with the questioning and enquiry. Every lesson will include a conclusion aspect to ensure the children can communicate what they have learnt.



Each Unit Plan ensures that the threshold concepts for science are taught across all teaching sequences and build upon prior learning. There are 6 key threshold concepts identified for science:

	<p><b>Comparative / Fair testing</b> - changing one variable to see its effect on another whilst keeping all others the same.</p> <p>Example: A car rolling down a ramp.</p> <p><b>Possible variables:</b> the height of the ramp, the surface of the ramp, what wheels of the car are made from, the shape of the car, the mass of the car, whether the car is pushed.</p> <p><b>Comparative Test:</b> If I change the car (the independent variable), what will happen to the distance the car travels (the dependent variable)?</p> <p><b>Fair Test:</b> If I change the surface of the ramp (independent variable), what will happen to the distance the car travels (dependent variable)?</p>
	<p><b>Research</b> - using secondary sources of information to answer scientific questions.</p> <p>Children might use pictures, books, websites or information sheets that have been prepared to help them find out answers to questions about any area in science. They may visit a museum or talk to a visitor in school or a parent about science.</p>
	<p><b>Observation over Time</b> - observing changes that occur a period of time ranging from minutes to months.</p> <p>All sorts of questions can be answered through observation over time. The period of time might be seconds, minutes, days or even months depending on the question being asked.</p>
	<p><b>Pattern Seeking</b> - identifying patterns and looking for relationships in enquiries where variables are difficult to control.</p> <p>Pattern seeking often starts with a question about a possible link between two events or phenomena. Sometimes, children will identify a <b>direct relationship</b> between two variables. For example, a shadow is taller when a light source is moved closer to an object. In this case, the tall shadow exists because the light has moved nearer the object: this is an example of a <b>causal relationship</b>.</p>
	<p><b>Identifying, grouping and classifying</b> - making observations to name, sort and organise them.</p> <p>Young children perform simple grouping tasks, sorting items by their observational features such as colour, shape or size. As children develop their knowledge of plants, animals and materials, they will sort and classify living things and materials using specific criteria.</p>

### Developing 'Scientists':

In order to develop 'Scientists', staff ensure that a sequence of learning contains the following components:

- *The National Curriculum's areas of knowledge, understanding and skills raising children's curiosity of natural and man-made phenomena.*
- *Specific links to the unique environmental and social context of the individual academy setting, whose investigation and exploration can open a window to the wider world and the complexities it holds.*
- *The 'core' knowledge to provide pupils with sufficient vocabulary and understanding to begin to engage in meaningful conversations about science.*

The programmes of study ensure that children's learning gains coherence as our children are required to organise and communicate their findings at the end of a sequence of learning; we want our children to gain an increasingly mature and informed scientific perspective on their world, preparing them for the future.

### **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 acquired knowledge and skills is measured throughout the programme of study. Where a written exit question is not appropriate for the task, the teacher is free to design a quiz or a practical task which can be evidenced with pictures and annotations etc.

On an annual basis, teachers provide a summative assessment for children within their class. This is analysed by the Subject Lead.

**Science Subject Lead: Kylie Beach**