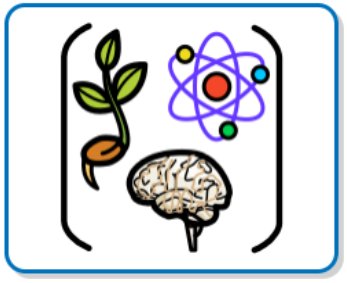
OLA Curriculum Implementation: Science

To ensure that our intent transfers into everyday classroom practice, our pedagogy and subject specific CPD is based on the Rosenshine Principles (incorporated within Plymouth CAST Principles Teaching and Learning) and Ebbinghaus' Forgetting Curve theory. This ensures that subject content is expertly delivered. We also deliver individualised coaching to all teachers to continually improve our practice.

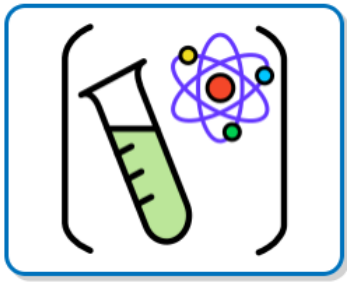
Core concepts in Science

Life Processes & Living Things (Biology)



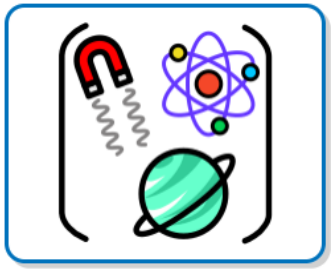
In primary science biology might include learning about how plants, animals and humans grow, survive and interact with their environment.

Materials and their processes (Chemistry)



In primary science chemistry might include learning about solids, liquids and gases, mixing different substances to see what happens, or understanding basic concepts like dissolving.

Physical Processes (Physics)



In primary science physics might include learning about how and why things move, how energy is transferred and how forces like gravity work.

The curriculum is mapped using these vertical concepts. We plan for progression using the structure outlined in the impact section below. Lesson content is planned towards these progression points and follows the model of direct instruction, shared and modelled practice before culminating in independent practice and mastery. Substantive knowledge is acquired through each unit of study to ensure broad and balanced coverage. This is supported by the use of vocabulary prompts and knowledge organisers, and reinforced using retrieval strategies using 'Do it Now' activities at the start of each lesson.

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Lesson Timetabling

Pupils complete one topic each half term of approximately 6 lessons. Pupils are further given opportunities across the curriculum to apply their Science knowledge and skills, particularly within Design & Technology where they investigate Design projects that often incorporate principles from science, like understanding materials' properties, forces, or energy sources, to create functional designs. In Early Years, children receive one discrete lesson per week and ongoing access to Science activities during the continuous provision.

Lesson Delivery Structure in Science

Introduction

- *Begin with a question, demonstration or real-world example to spark curiosity and connect to the topic.*
- *Review or revisit related concepts.*

Investigate and Record

- *Introduce new scientific ideas or concepts through hands-on activities, experiments or observations.*
- *Guide pupils to understand the scientific concepts behind their exploration.*

Reflection and Assessment

- *Reflect on learning.*
- *Demonstrate their understanding.*

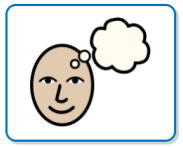
Adaptation, Extension & Enrichment: Science

Some of the **adaptations** we make to learning in Science for pupils are as follows:

- Small step instructions, repetition, modelled examples
- Vocabulary pre-teaching episodes
- Smart grouping - pairing with more able reader/writer and opportunities for paired talk
- Provision of word mats and knowledge organisers with images, diagrams & widgets - these are also sent home at the start of a topic
- Simplified text to match reading ability
- Extra scaffolding for research activities through the provision of specific questions and websites for research activities
- Individualised learning tasks targeting the Gateway key for the unit
- Extra thinking/processing time

For pupils that struggle to record their ideas, we also provide **support for written tasks** in the following ways:

- Provision of suggested sentence starters or writing frames
- Use of cut and stick/matching and cloze procedure paragraphs to reduce the writing load
- Use of word processing software
- Sound buttons to hold a sentence
- Adult to scribe



We **extend** learning in Science by:

- Encouraging pupils to adapt experiments to develop their mastery of science disciplinary knowledge
- Asking questions and suggesting opportunities for further exploration

The Science curriculum is **enriched** for all pupils through:

- Developing cross-curricular links e.g application of learning through Design Technology projects
- A planned programme of educational visits and workshops
- Extra-curricular clubs
- Links to additional reading, both fiction and non-fiction, are also provided for all topics.