



MARISH



Academy Trust

SCIENCE POLICY

February 2020

Introduction

At Marish Academy Trust, we understand that learning is a change to long-term memory and we aim to ensure that our students experience a wide breadth of study and develop their procedural and semantic knowledge which is meaningful, builds on previous understanding and connects across contexts. We want our students to be curious about the world, confident in exploring practical investigations and competent at analysing results to draw conclusions.

Intent:

At Marish Academy Trust, our key curriculum drivers:

- Aspirations, enshrined in our vision, for all children to achieve the best possible outcomes and so improve their life chances;
- Resilience building, so each child leaves our schools equipped with the capacity to overcome the challenges and changes they will inevitably face in life;
- Rich, varied and ambitious curricular and extra-curricular opportunities, which endow pupils with cultural capital.

Our curriculum distinguishes between subject topics and threshold concepts. Subject topics, or substantive knowledge, are the specific aspects of subjects that are studied and incorporated together to create curriculum breadth. Threshold concepts, or disciplinary knowledge, connect subject topics and key skills into meaningful schema. The same concepts are explored in a wide breadth of topics and allow student to return to the same concepts again and again and build an understanding of them over time.

The threshold concepts in our Science curriculum are Working Scientifically, Biology, Chemistry and Physics.

The concept of Working Scientifically involves learning the methodologies of the discipline of science, including:

- Asking questions
- Performing tests
- Making observations
- Taking measurements
- Gathering and recording data
- Presenting finding

Within the other three threshold concepts we address the following topics:

- Biology
 - Understand plants
 - Understand animals and humans
 - Investigate living things
 - Understand evolution and inheritance
- Chemistry
 - Investigate materials

- Physics
 - Understand movement, forces and magnets
 - Understand light and seeing
 - Investigate sound and hearing
 - Understand electrical circuits
 - Understand the Earth's movement in space

Implementation:

The science topics are planned so they build upon prior learning. We understand that for learning to be embedded, we have to make changes to our long term memory. We believe that learning is most effective with spaced repetition, interleaving between subjects and the improvement on both storage and retrieval strength in long term memory. Our teaching is rooted in the understanding that sustained mastery takes time. There are opportunities for children of all abilities to develop their skills and knowledge in each unit. Progression is built into the planning so that children are increasingly challenged as they move through the school.

We use a variety of teaching and learning styles in science lessons. Our principal aim is to develop children's knowledge, skills and understanding. Children are encouraged to ask, as well as answer and investigate scientific questions. They have the opportunity to use a variety of data, such as statistics, graphs, pictures and photographs as well as a magnitude of scientific equipment to further enhance learning through awe and wonder. ICT is used to enhance learning.

We recognise that there are children of widely different abilities in all classes and we ensure that suitable learning opportunities are provided for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways by:

- setting common tasks which are open-ended and can have a variety of responses;
- setting tasks of increasing difficulty;
- grouping children by ability in the room and setting different tasks for each ability group;
- providing resources of different complexity, matched to the ability of the child;
- using classroom assistants to support the work of individual children or groups of children;
- learning science outside the classroom on educational visits and workshops.

We recognise that it is vital for students to have practical, hands-on experiences in order for their learning to be meaningful and so we ensure that there are high quality resources available for teachers and students to use in lessons, including ICT resources as appropriate

Impact:

Because learning is a change to long-term memory, it is impossible to see impact in the short term. We do, however, use assessments based on threshold concepts in science. We use comparative judgement in the tasks we set, such as Proof of Progress (POP) tasks, and by comparing a student's work over time. POP tasks are completed at the end of each unit of work and are in a variety of forms including:

- Practical investigations;
- Children selecting appropriate equipment or information sources to address specific questions or ideas under investigation;
- Through discussion;
- Written work;
- Concept maps;

As a Trust, we monitor the standard of students' work and of the quality of teaching in science through regular impact reviews. These reviews include scrutiny of planning, student work, lesson observations and assessment data.

Equal opportunities

We aim to provide equality of opportunity for all children whatever their age, ability, gender, race or background. We want all pupils to achieve their full potential during their time at Marish and Willow Primary Schools. As such, we work to ensure that our expectations, attitudes, and practices enable all children to reach their potential.

Marish Academy Trust is committed to ensuring equal treatment of all pupils with any form of disability and will ensure that disabled children are treated favourably in any procedures and practices. When a child's disability has been disclosed, the school will ensure reasonable adjustments are put in place so that they can have full access to the curriculum.

Children with English as an Additional Language (EAL)

All pupils with EAL are provided with opportunities to achieve in this subject area and often use colourful semantics to support their writing. When appropriate, activities are differentiated so that all learners can access the curriculum. At specific times, the EAL support team work alongside children to support them with their learning.

Gender Equality

All staff ensure that current and future policies and practices in science do not discriminate against either gender, or maintain or lead to gender inequality. Any curriculum developments are monitored to identify if they have had an adverse impact relating to gender issues.

Special Educational Needs

At Marish Academy Trust, we are continually striving for an inclusive multi-sensory approach which values and embraces the individual learning differences of the children within our schools. Therefore, in addition to targeting individual needs through differentiation, intervention programmes and EHCP's, we are also focusing upon specific areas within our classrooms, with the aim of continually improving and developing our inclusive practice.

Gifted and Talented Children

Within Marish Academy Trust, up to 10% of the school population may be considered gifted and talented. All teachers should ensure that more able children are identified and receive

the appropriate support and challenge in all lessons to further extend and enhance knowledge.

Natasha Gentles, Dawn Johnston, Lola Ogundipe, Bernie Newton, Grant Fuller

Trustwide Science Team.

February 2020
To be reviewed January 2022