

## St Margaret's Academy – Science Policy

### School vision and values

#### Vision

We want ourselves and the children in our care to be successful, resilient and inquisitive learners who are happy and well-equipped to participate positively in the community and wider society.

#### Values

Our school values (kindness, respect, responsibility and aspiration) are an essential point of reference on all of our journeys. British values (democracy, rule of law, liberty and respect) play an equally important role.

### Definition of Science

- Science is learning about the physical and natural world through observation and experiment.
- We learn about science to help us to understand how the world around us works.

### Intent in Science:

At St Margaret's Academy we encourage children to be inquisitive learners. We want them to be excited to learn about new scientific concepts and see how this new learning fits in to the world around them. We want children to develop a secure understanding of key knowledge across the range of units within the curriculum. They will also develop the scientific skills they need in order to investigate their own ideas and questions.

### Rationale for Science Why we teach Science in each phase

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how

science can be used to explain what is occurring, predict how things will behave, and analyse causes. As they move through the school, they build their substantive knowledge across each of the three disciplines and they develop their disciplinary skills, known as 'working scientifically' skills. Units will be blocked to allow children to immerse themselves in the topic and all units are revisited at the end of the year. Children will also recap previous learning at the start of a new unit to encourage long-term retention of knowledge.

### **Foundation Stage**

For children:

- To start their exploration of science, under the 'Understanding the World' learning aspect as led by the children's interests.
- To explore the natural world around them; plants, animals, changes of state and the seasons
- To make simple observations of the natural world and look for similarities and differences.

### **Year 1 & 2**

For children:

- To ask simple questions and use their observations and perform simple tests to suggest answers to these questions.
- To identify the different signs of the 4 seasons and describe how they affect us.
- To develop their knowledge of plants and what they need to grow.
- To learn about different groups of animals and their habitats, including what they need to survive.
- To test the different properties of materials and consider their suitability.

### **Year 3 & 4**

For children:

- To develop their questioning, testing and observational skills; gather, record and present data in order to answer questions; make predictions and draw conclusions.
- To build on their knowledge of plants: functions of parts, lifecycles and classification, and their knowledge of animals (including humans): nutrition, skeletons, muscles, food chains, the human digestive system and teeth.
- To learn about rocks and fossils: grouping and classifying
- To investigate how light and sound travel, how sound can be changed and how shadows are made.
- To experiment with simple electrical circuits, including switches and how forces effect things around us, including the use of magnets.

### **Year 5 & 6**

For children:

- To plan different types of scientific enquiries to answer questions; take measurements, using a range of scientific equipment; use test results to make

predictions to set up further comparative and fair tests; report and present findings from enquiries, including conclusions.

- To compare lifecycles of different plants and animals, including reproduction and to learn about the human circulation system, how humans change over time and the effects of different lifestyles. They will also explore inheritance and evolution.
- To build on their knowledge of materials including separating mixtures, evaporation and irreversible changes.
- To learn about the Earth in space, day and night, the solar system and how forces (such as gravity and friction) affect us.
- To further explore light and shadows and to experiment with more complex electrical systems, varying components and recording the effects.

### How the whole school 'curriculum statement' intent will be threaded through science.

1. Underpinning everything is our work on attachment, and social and emotional learning which are integral to all that we do – *In science, we learn about our impact on the world around us and our responsibilities, in order to have a positive effect. We work together when experimenting to plan, carry out and make conclusions. Sometimes we need to challenge each other's ideas and explain our own ideas respectfully.*
2. Early reading and language development across the school are core aspects woven through the curriculum  
– *In science, we introduce subject specific vocabulary and model how to use it correctly. This is supported through paired and group discussions.*
3. Teachers plan lessons that inspire and engage, and promote enquiry and imagination so that pupils at all abilities can achieve. We develop curiosity about the world beyond the bay. Progressive subject knowledge and skills are planned to take advantage of local opportunities such as the beach and local artists, as well as national events. We provide opportunities to contribute in the local and global community. – *In science lessons, we use a range of hooks to engage the children and hands-on experiences whenever possible, including the use of the school grounds and the local area. We learn about global issues and both the positive and negative effects of scientific advances. Science is sometimes used as a lead subject in class topics, linked to other areas of the curriculum.*
4. We support our pupils to develop the skills they need in order to learn for themselves, and to enjoy this learning – *In science, we base our learning around asking questions of the world around us and then researching, observing and experimenting to find evidence to answer these questions ourselves as much as*

*possible. We nurture enjoyment through wider school competitions, celebrating science week and whole-school science-based homework projects.*

- 5. We support our families and staff with their well-being – In science, we support staff with their role in teaching science and encourage them to share their personal enjoyment of the subject. We send home collectables and topic overviews to involve families in the children's learning. The subject blogs on the school website also engage families.*

## **Best practice in teaching and learning**

### **Coverage**

Teachers ensure that the National Curriculum 2014 is taught and additional links are made with other subjects where appropriate, following the whole-school coverage document. Units are revisited to build knowledge over time. Disciplinary science skills are built over time in school and spread across all units. New science learning is taught in blocks so that the learning is immersive. Additional weekly science 'flashback' sessions are taught weekly to revisit learning.

### **Engagement**

Teachers use a range of hooks to engage the children and hands-on experiences whenever possible, including the use of the school grounds and the local area. All science learning is related to real-life contexts, giving purpose and value to the knowledge and skills being taught. Local and global links should be made including trips out and visitors into school. Children are involved in whole school initiatives, including Science week, homework projects and competitions. Where there are links to other subjects, science learning may be applied to a final outcome.

### **Inclusion**

Teachers are responsible to meet the needs of all learners through their teaching of science. Teachers consider these needs when planning and carefully consider how children will record their learning, e.g. use of ICT, writing frames and oral presentations.

### **Planning sequence**

Teachers use AfL to highlight gaps in previous knowledge and recap prior learning before building new knowledge and skills. Children create questions, collect evidence (through observation and experiments) and draw conclusions. Children's level of understanding is assessed through a variety of means and used to inform final judgements (see below).

Good science lessons at St Margaret's should ...

- Recap previous learning and then build on it, directly challenging common misconceptions.
- Be based around a Learning Question (e.g. How do our bodies change as we get older?)

- Identify the type of enquiry and the scientific skills that will be used to answer the LQ (e.g. observation, testing, making predictions).
- Use 'Star Words' (key vocabulary) and model their correct use.
- Include a range of relevant activities (hands-on as much as possible) that cater to the different needs of the class, including SEN pupils.
- Include a sequence of more challenging tasks, open to all children.
- Conclude by answering the LQ (tackle any misconceptions/inform next session)

## Assessment

Assessment is an integral part of the teaching and learning cycle and will be used as a tool to adjust teaching to meet the needs of each pupil.

In science:

1. Assessment for learning is used at the beginning of each unit and then throughout the teaching sequence. We then alter teaching as necessary to fill any gaps in knowledge - this may be planned into 'flashback' sessions.
2. Observational assessments are continuous; these may be recorded on Seesaw and teachers' own records.
3. Final unit assessments, in a range of age-related forms, are used to support overall assessments. From Y2, this should include a short written assessment linked to the key objectives.
4. Teachers use all of the above to inform their final judgements at the end of the unit enter judgements onto SIMS.
5. 'Working scientifically' skills are assessed throughout the year and final judgements are made at the end of the year.
6. Teachers will moderate their judgements across their year group and then across phases (in staff meetings). Further moderation materials are available from the Subject Leader.

## Progression of skills

Please see the science progression documents for:

- Substantive Knowledge (titled 'Progression of Knowledge')
- Disciplinary Knowledge/Working Scientifically (titled 'Working Scientifically Progression of Skills')

Link here: staff shared – curriculum - curriculum leadership – science

[https://drive.google.com/drive/folders/18izUrgeiAcqc\\_ompSofoual-IFEKSSvh?usp=sharing](https://drive.google.com/drive/folders/18izUrgeiAcqc_ompSofoual-IFEKSSvh?usp=sharing)

### Science Curriculum Map

Please see the science whole school overview that shows curriculum coverage (working document)

- Science Coverage (Year)

Link here: staff shared – curriculum - curriculum leadership – science

[https://drive.google.com/drive/folders/18izUrgeiAcqc\\_ompSofoual-IFEKSSvh?usp=sharing](https://drive.google.com/drive/folders/18izUrgeiAcqc_ompSofoual-IFEKSSvh?usp=sharing)

### Planning

Please see Foundation and KS1 long term planning here:

<https://drive.google.com/drive/folders/1A4KaYAF9xuRvV84JQA7kinc7tOdi5Oqz?usp=sharing>

Please see KS2 long term planning here:

<https://drive.google.com/drive/folders/1A4KaYAF9xuRvV84JQA7kinc7tOdi5Oqz?usp=sharing>

Please see Foundation and KS1 medium term planning here:

<https://drive.google.com/drive/folders/1A4KaYAF9xuRvV84JQA7kinc7tOdi5Oqz?usp=sharing>

Please see KS2 medium term planning here:

<https://drive.google.com/drive/folders/1A4KaYAF9xuRvV84JQA7kinc7tOdi5Oqz?usp=sharing>

Please see an example of FS/KS1 Science collectables here:

<https://drive.google.com/drive/folders/1A4KaYAF9xuRvV84JQA7kinc7tOdi5Oqz?usp=sharing>

Please see an example of KS2 Science collectables here:

<https://drive.google.com/drive/folders/1A4KaYAF9xuRvV84JQA7kinc7tOdi5Oqz?usp=sharing>