

Science Policy

# Sinai Jewish Primary School

**February 2021**

Our vision at Sinai is for all children to leave us as inquisitive learners, excited about the natural phenomena in the world around them. Our science curriculum aims to provide children with the tools they need to explore and discover the world in which we live. Through hands-on, collaborative enquiry based learning children will be able to make predictions and test theories.

# Intent

We intend for children to:

* develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
* develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
* be equipped with the scientific skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this

# Implementation

The National Curriculum is used as the basis for our curriculum planning and we ensure that each topic is covered for an appropriate amount of time and links to other areas of learning as well as the class texts (where possible). The children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

We ensure that the working scientifically skills are built-on and developed throughout children’s time at school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

Where suitable, opportunities have been made to integrate with our school’s culture and ethos.

# Teaching and Learning

* All science lessons follow a six part lesson; do now, new learning, talk task, develop learning, independent task, plenary
* We ensure that at the start of each lesson there is the chance to recap prior learning, this is not just from previous learning in the topic, but also from previous year groups.
* We build upon the learning and skill development of the previous years. As the children’s knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
* Scientific work is recorded in a variety of ways appropriate to the age of the children and their individual needs in each key stage. This can include; photographs, labelling, drawings, tables, graphs, written accounts and formal write ups. It is expected that all recorded science work is to be presented to a high standard. The balance of practical activity and length of recording tasks is carefully planned to maintain a scientific emphasis.
* At the beginning of every topic key vocabulary will be shared with the children, this will then be reinforced throughout lessons. They will build up an extended specialist vocabulary. When marking, teachers highlight the specific vocabulary that has been used in orange.
* Children are encouraged to ask questions and be given opportunities to use their scientific skills and research to discover the answers.
* As part of the whole school initiative to answer in full sentences children will be expected to use key vocabulary when answering questions verbally and written in class as well as when talking with partners or in groups. Teachers will also ensure they model sentence starters with correct terminology when expecting a response. Key vocabulary will also be displayed in the classroom on the science working wall for children to refer to at all times.
* They will have opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.
* At Sinai, children are offered a wide range of extra-curricular activities, visits, trips, clubs and visitors to complement and broaden the curriculum giving the children a greater appreciation for the world around them.
* Regular events such as Science Week, allow all pupils to come off-timetable, provide broader provision and allow for the acquisition and application of knowledge and skills.

# Working scientifically

Working scientifically skills are embedded into every lesson.

Within every lesson there is a working scientifically objective. We believe working scientifically increases children’s understanding to:

* Develop and deepen conceptual understanding.
* Work with independence. Thinking and reasoning is nurtured alongside a host of qualities, including resilience, determination and confidence.
* ‘Be a scientist’. A necessary toolkit of practical skills is developed and added to over time.
* Communicate effectively. Technical and scientific vocabulary is learned, practised and used, as children communicate evidence in a variety of ways, often with different audiences in mind.
* Answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information.

# Scientific Investigations

* Teachers plan one formal investigation within a unit of work - supporting the ‘big question’.
* Teachers use a planning pro-forma which supports the progression of skills throughout the school. These detail the aim of the investigation, prediction, method, variables, results, conclusion and evaluation.
* Children engage in scientific investigations through: raising questions, forming hypotheses, identifying variables, choosing appropriate experiments, equipment and devising efficient methods. The children observe changes and collect results from their findings. They analyse their results using carefully chosen graphs and they draw scientific conclusions based on these results. Finally, children evaluate the effectiveness of their scientific methods.
* Teachers promote children’s independent skills to plan, carry out and evaluate. They may ask**;** How would you investigate...? (refer to scientific concept taught), How did/could you make this a fair test? If you carried out the investigation again, what would you do differently? What would you predict might happen if...? What was your reasoning for your prediction? What have you learnt from this investigation? What do your findings tell you? Were there any results that surprised you?
* As the children’s knowledge and understanding increases, they become more proficient in selecting and using scientific equipment, collating and interpreting results. They become increasingly confident in their growing ability to come to conclusions based on real evidence.

# EYFS

Young children are naturally curious and passionate about learning. At Sinai, we provide a stimulating EYFS curriculum that nurtures children’s natural curiosity and their on-going knowledge and understanding of the world around them. Through hands-on, enquiry-based activities, children will experience the joy of learning ‘how’ and ‘why’.

The Foundation Stage delivers science content through the ‘Understanding the World’ strand of the EYFS curriculum. Science is an integral part of provision both indoors and outdoors in the EYFS. This involves guiding children through offering opportunities for them to use a range of tools safely; encounter creatures, people, plants and objects in their natural environments and in real-life situations; undertake practical ‘experiments’; and work with a range of materials.

# Resources

The school holds a central place for frequently used resources. Teachers and children are encouraged to choose from a range of equipment in their lessons. The Science lead is responsible for maintaining this area and ordering any necessary items that have been identified as a need. All staff members have a shared responsibility for collecting and returning necessary items to the correct place to ensure that resources are easy for all staff to access. The science lead conducts an audit regularly to ensure we are able to provide the appropriate resources for each year group based on their planning for a specific topic, this ensures teachers plan in advance and are ready and well prepared for their upcoming topics.

# Health and Safety

The safe use of equipment and consideration of others is promoted at all times. The Association for Science Education publication, “Be Safe!”, should be used by staff as a point of reference for issues regarding health and safety. The school’s “Health and Safety Policy” should be consulted for details regarding scissors, craft tools, electrical equipment, wet areas, heavy equipment and use of other tools. When planning activities, safety issues should be identified and acted upon accordingly. Children should be made aware of safety issues and, where appropriate, the reasons behind them.

# Impact

We assess children’s work formatively in science through observations, questions and marking to ensure they gain a full understanding of what each child has learnt, and what is needed to progress their understanding.  Teachers plan for ongoing assessment opportunities in every topic. These assessments inform the class teacher’s planning for future lessons.

At the start of each unit, key objectives are identified. These are summarised in ‘Unit markers’ and take the learning objectives from the NC for each unit of work for years 1 to 6. They are split into some, most and all. Therefore giving a clear picture of which children are working towards, are at or are achieving greater depth.  The unit markers also include the scientific enquiry objectives for each year group.

Unit markers also include;

* challenging vocabulary (to support children’s discussions and explanations in lessons),
* space for teachers to record their observations of children carrying out investigations,
* a key scientist (in KS2) linked to the unit
* the big question - for children to answer at the end of a topic (the children can annotate around this)

Questioning

Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. Specifically planned questions help create a deeper level of processing any previously learned content into children's long term memory.

Observations of investigations

Observations take place during a formal investigation, at least once each topic. Teachers use this opportunity to focus on individual groups/children and observe how they participate, conduct the investigation, show their understanding and how they work alongside their peers using questions and sentence starters. This comment is written on the unit marker to demonstrate the child’s understanding.

Ongoing planned assessments

We believe it is important that assessment happens throughout the children’s learning. This can be done at different stages of a lesson, summarising children’s knowledge and understanding. This shows and focuses on how children work independently.

Marking

Teachers marking and feedback should;

* Address any misconceptions and scientific knowledge
* Develop investigative skills and scientific enquiry
* Extend scientific understanding using reasoning skills – e.g. What time/s of day would your shadow be at its longest? Approximately how many days would it take for the Earth to complete half its orbit around the Sun? Where would (animal) survive better, \_\_\_\_\_ or \_\_\_\_\_? Explain your answer?

Summative judgements

At the end of a unit of work, the class teachers make a judgement about the children’s achievements. Teachers base their summative judgements of pupil’s learning on a range of evidence; independent work in the children’s books (including the planned ongoing assessments), observations of investigation and an end of topic assessment (SIGMA). At the end of each term teachers also take part in year group moderation to align judgements and to look at a sample of work from a range of children. This discussion is led by the Science leader.

#### *Review*

This Science policy will be reviewed by the Science Curriculum Leader and the Senior Leadership Team.

Ratified by Curriculum Committee: 03.02.21

Date for next review of this document: Feb 2024