

MANCHESTER COMMUNICATION PRIMARY ACADEMY

# INTENT AND SEQUENCING

Science Page Profile

Curriculum



# SCIENCE AT MCPA

## Intent

Children have weekly science lessons throughout Key Stage 1 and 2. In EYFS, science is taught through the children learning about the world around them. Children participate in hands on activities, allowing for plenty of talk to take place; language is a vital means of communication and the classroom offers a safe base for exploration of the real world, thus we actively support the principles of nurture in day to day lessons. Real life experiences are planned for, in order to make learning more purposeful (e.g. looking at chicks and tadpoles for life cycles). Science is taught through the continuous provision and as a focused activity. Additional opportunities are provided in Science, such as visits (for example MOSI and Jodrell Bank) and using other staff (such as MCA) to support with the delivery of the curriculum. Here at MCPA, we use Snap Science to support the delivery of high quality lessons with a clear progression, which meet the high expectations of the National Curriculum..

Units of work build on each other (week after week and year after year) and children have an adequate amount of time on a topic to develop a secure understanding. The use of knowledge organisers promotes the use of scientific vocabulary and supports children with their scientific knowledge. The progression of scientific vocabulary is supported using a combination of ASE matrices and Snap Science. Our planning takes into account tackling and getting rid of misconceptions (such as the difference between mass and weight). In key stages 1 and 2, a weekly rotation of either a science quiz or a writing revolution activity supports children with their retrieval of facts. Lesson plans also take into account questioning and checking for understanding where the appropriate feedback is given, covering misconceptions. Teachers also provide opportunities for children to carry out skills including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating. Working scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. Teachers demonstrate how to use scientific equipment, and the various working scientifically skills in order to embed scientific understanding. Teachers plan lessons so that the children are active in their learning through the use of songs, collaborative learning tasks and pupils teaching pupils. Maths, English and PE cross curricular links are all mapped out for each half term, allowing children to (purposefully) embed and apply their knowledge.

The School's Vision and Principles for science support our implementation and can be seen below:

## Vision

Science at MCPA is active, enjoyable, collaborative, inquiry based and reflective.

We support children to build upon and develop their existing knowledge as they grow and encounter more of the world around them, nurturing their curiosity about the wider world and how it works. Children revisit and reflect upon what they have already learnt in order to embed and develop learning. We provide opportunities for children to apply and evolve their knowledge through enquiry and investigation, supporting them to build the confidence to question and challenge. We understand that science should be relevant, and so we encourage our students to make links with real life science through a range of clubs, encounters and visitors. As a community we recognise that learning is continuous and so support not only our children, but also our staff to build confidence through access to high quality CPD.

## Principles

- Children enjoy science, actively participating in lessons, seeking challenges and show a can do attitude.
- Children explore scientific concepts and collaborate through investigation.
- Teachers are confident in the scientific skills and knowledge that they are teaching and are able to model effectively. They are supported by high quality, relevant CPD.
- Children can ask their own relevant questions, using the correct vocabulary and are able to articulate their knowledge clearly about a specific topic.
- Children are supported to recognise scientific principles in everyday life.
- Children build on prior knowledge and reflect on their learning.

## Implementation

Children have weekly science lessons throughout Key Stage 1 and 2. In EYFS, science is taught through the children learning about the world around them. Children participate in hands on activities, allowing for plenty of talk to take place. Real life experiences are planned for, in order to make learning more purposeful (e.g. looking at chicks and tadpoles for life cycles). Science is taught through the continuous provision and as a focused activity. Additional

opportunities are provided in Science, such as visits (for example MOSI and Jodrell Bank) and using other staff (such as MCA) to support with the delivery of the curriculum. Here at MCPA, we teach science through key themes for each half term, using the National Curriculum to ensure we have clear progression.

Units of work build on each other (week after week and year after year) and children have an adequate amount of time on a topic to develop a secure understanding. The use of knowledge organisers promotes the use of scientific vocabulary and supports children with their scientific knowledge. Our planning takes into account tackling and getting rid of misconceptions (such as the difference between mass and weight). In key stages 1 and 2, a weekly rotation of either a science quiz or a writing revolution activity supports children with their retrieval of facts. Lesson plans also take into account questioning and checking for understanding where the appropriate feedback is given, covering misconceptions. Teachers also provide opportunities for children to carry out skills including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating. Working scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. Teachers demonstrate how to use scientific equipment, and the various working scientifically skills in order to embed scientific understanding. Teachers plan lessons so that the children are active in their learning through the use of songs, collaborative learning tasks and pupils teaching pupils. Maths, English and PE cross curricular links are all mapped out for each half term, allowing children to (purposefully) embed and apply their knowledge.

## Impact

All children feel they are scientists and capable of achieving. Children overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding. Children learn the possibilities for careers in science as a result of our community links and connection with national agencies such as the STEM association. Children not only acquire the appropriate age related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives. Children leave MCPA with a richer vocabulary which will enable them to articulate their understanding of taught concepts.

## Research

### Rosenshine's Principles in Actions

#### In Memory for Learning by Alex Quigley (2016):

1. **'Active learning'** in this sense means thinking hard and not passively receiving information. Rather than re-reading class notes, a student summarises the key ideas from the notes and using a graphic organiser to reshape the content into a new, meaningful pattern. The student is actively grappling with the content, reshaping, rehearsing, challenging, connecting and more, in novel and creative ways.
2. **Using song or rhythm** We know that students remember the words of songs and can sing them verbatim. Using rhythm or songs and chanting them can help them remember concepts. There are many already written and prepared on YouTube, but would be more valuable if the students come up with them on their own.
3. **Students teaching students** Create opportunities for students to take over the teaching. Ask a group of students to create a presentation on part of the topic. They then deliver this to the whole class. Students will have to be really familiar with the concepts in order that they can teach it.
4. **Quizzing** is one of the ultimate memory strategies. It has to be regular but not too close together, it has to be repeated and it needs to be cumulative. By quizzing/testing we are ensuring that they continue to remember. In the book 'Making it Stick: The Science of Successful Learning', they advocate periodic quizzing and testing as recalling facts from memory is more effective than just rereading them.
5. **Revision flash cards** These should not be just facts that they can remember but should rather have questions on one side and answers on the back. They can use them to test themselves and also use them for parents and/or students to test them. They are another proven example of effective, 'active' learning, drawing on the power of 'retrieval practice'.