

## **Intent:**

At Pitmaston, we aim to ignite our pupils' passion for science, and develop their motivation to study this subject, becoming our future Scientists. Pupils will be given the foundations for understanding the world through scientific interpretation. Our ambitious, high-quality and progressive curriculum develops children's substantive and disciplinary knowledge, whatever their starting point, cultivating a sense of excitement and curiosity about natural phenomena.

We develop the pupil's awareness as to how science has changed our lives and how it is vital to the world's future prosperity and sustainability. We teach and aim for all of our pupils to be able to answer scientific questions, analyse causes and draw valid conclusions in order to become inquisitive scientists. We ensure all pupils are exposed to high-quality science teaching and a range of learning experiences. Science teaching is carefully sequenced to ensure a clear progression of substantive and disciplinary knowledge as well as building on pupil's prior knowledge, allowing for misconceptions to be addressed effectively. We encourage our pupils to be enquiry-based learners so that they can develop the necessary disciplinary knowledge as they progress through the school. The following substantive concepts are taught through the different disciplines of science.

## **Biology**

- Living things and their habitats & Plants (Animals, humans, plants, habitats)
- Evolution and Inheritance (evolution, inheritance, life processes, life cycles)

## **Chemistry**

- States of matter (Solids, liquids, gases)
- Materials (properties and changes) (Reversible/irreversible changes)

## **Physics**

- Light, sound, electricity
- Forces (Friction, air resistance, gravity, magnets)
- Earth and Space (Seasons, day and night, solar system and beyond)
- Rocks

## **Implementation**

The acquisition of key scientific knowledge is an integral part of our science lessons. Linked knowledge organisers enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. Substantive knowledge has been organised around a set of key concepts, which are revisited as pupils progress through school. (See progression document). The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons.

At Pitmaston, teachers create a positive attitude to science learning within their classrooms and our newly built laboratory, which reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following:

- Science will be taught in planned, and arranged, topic blocks by the class teacher. Our strategy is to enable all children to be catered for through adapted planning suited to their abilities
- We plan for problem solving and real-life opportunities that enable children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.
- Planning involves teachers creating practical, engaging lessons with opportunities for precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning.

- Our curriculum is progressive. We build upon the learning and skill development of the previous years, which is tested through our low stake quizzes, questioning and tests, where teachers can identify misconceptions that need addressing and as a tool for formative and summative assessment.

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. This is developed through the years, in line with the topics. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.

Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts. As the pupil'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. Through enrichment days, such as science week/day, CREST/Discovery awards and STEM days, we promote the profile of Science and allow time for the children to freely explore scientific topics.

Across the year, we explore different aspects of scientific enquiry and build pupils' skills and disciplinary knowledge in each aspect as they progress through school.

- **Observing over time:** (observing or measuring how one variable changes over time)
- **Identifying and classifying:** (identifying and naming materials/living things and making observations or carrying out tests to organise them into groups.)
- **Looking for patterns:** (making observations or carrying out surveys of variables that cannot be easily controlled and looking for relationships between two sets of data)
- **Comparative and fair testing:** (observing or measuring the effect of changing one variable when controlling others)
- **Answering questions using secondary sources of evidence:** (answering questions using data or information that they have not collected first hand)
- **Using models:** (Developing or evaluating a model or analogy that represents a scientific idea, phenomenon, or process)

## Impact

The successful, collaborative approach to the teaching of science at Pitmaston results in a fun, engaging, high- quality science education, that provides pupils with the foundations for understanding the world that they can take with them once they complete their primary education. Pupils learn the possibilities for careers in science as a result of our community links with the Worcester University, STEM association and our partnership with the Ogden Trust, who are helping raise the profile of physics in science at a primary level. To further develop the Science curriculum, pupil voice is used through questioning of pupils' views and attitudes towards Science, to assess the children's enjoyment of science, and to motivate learners.

By the end of their primary school education, pupils will:

- Have an understanding of the key domains of knowledge and can use key concepts to make links between domains
- Ask questions and make observations about the world around them using scientific knowledge
- Analyse data and articulate evidenced conclusions
- Follow and design scientific enquiries
- Have an understanding of some of the major issues facing our planet and an appreciation of the importance of science to wider society