

SCIENCE

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Being a Scientist

Scientists are people who:

Have the ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.

Show confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.

Have excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.

Demonstrate high levels of originality, imagination or innovation in the application of skills.

Have the ability to undertake practical work in a variety of contexts, including fieldwork.

Show a passion for science and its application in past, present and future technologies.

Curriculum Intent

At Holly Park, we intend to offer our pupils new and exciting experiences through activities that are designed to build resilience, confidence and self-esteem. We recognise that a curriculum has to be broad, balanced and offer pupils opportunities to grow and make progress as individuals from whatever their starting points may be. The curriculum promotes all forms of equality and fosters greater understanding of, and respect for people of all faiths and those of no faith, races, genders, ages, disability and sexual orientations, It keeps pupils safe from the dangers of abuse, sexual exploitation, radicalisation and extremism. It contributes to pupils' behaviour and welfare, including their physical, mental and personal well-being, safety and spiritual, moral, social and cultural development. It provides both skills-based as well as knowledge-based learning and ensures continuity and progression within the school and between each phase of education. Our curriculum is supported by enrichment days, weeks and extra-curricular activities. We want to make learning fun, practical and exciting to ensure that it is embedded in the long-term memory. The curriculum values prior knowledge and moves on from this point to extend learning. Our curriculum is based upon 4 main principles:

Creativity:

- Is inclusive, exciting and engaging.
- Stimulates creative thinking and problem solving.
- Discovers, nurtures and celebrates children's talents.

Ambition:

SCIENCE Intent

At Holly Park, we understand that children are naturally curious and we encourage this inquisitive nature throughout their time with us and beyond.

Science fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and a positive attitudes.

Through the programmes of study in the EYFS and the National Curriculum science document children will acquire and develop these skills throughout their Primary years.

We ensure that the *Working Scientifically* skills are built-on and developed throughout their school career so that they can use equipment, conduct experiments, build arguments and explain concepts confidently and continue to ask questions and be curious about their surroundings.

Subject Strategy

- Teaches the essential skills of English and Mathematics across the curriculum.
- Is broad and balanced.
- Teaches resilience and the ability to persevere.
- Is well sequenced, progressive and memorable.
- Prepares children for the next stage of their education.

Curiosity:

- Reflects our diverse community.
- Develops effective communication skills
- Fosters enthusiasm and a love of learning.

Health:

- Supports British Values and our school values.
- Encourages a mentally and physically healthy lifestyle.
- Nurtures and supports social and emotional development.

The 2014 National Curriculum for Science aims to ensure that all children:

- 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.
- Are 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.

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SCIENCE Implementation

Teachers create a positive attitude to science learning within their classrooms and 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, to have a project-based approach. This is a strategy to enable the achievement of a greater depth of knowledge.
- Through our planning, we involve problem solving opportunities that allow 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 engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in

SCIENCE Impact

We want our children to leave Holly Park with the behaviours that they need to succeed in the world. They will be confident and successful lifelong learners.

We want to help our pupils to:

- Develop lively, enquiring minds, an ability to question and argue rationally and an ability to apply themselves to tasks and physical skills.
- Acquire understanding, knowledge and key skills relevant to school, adult life, and employment in a fast-changing world.
- Be able to use language and number effectively.
- Develop personal moral values, respect for religious values and tolerance of other races, religions and ways of life.
- Understand the world in which they live and the inter-dependence of individuals, groups and nations.

Subject Strategy

- class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning, so that all children keep up.
- 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.
- Working Scientifically*, skills are embedded into lessons to ensure these skills are being developed throughout the children's school career. New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping 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.
- We believe that practical experiments are essential when teaching science

In EYFS Science is covered in the 'Understanding the World' area of the EYFS Curriculum. It is also covered through Communication and Language and Personal, Social and Emotional development. It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

In KS1 the principal focus of science is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly. They are encouraged to be curious and ask questions about what they notice. They can be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to 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. They begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science is done through the use of first-hand practical experiences, but there are also some use of appropriate secondary sources, such as books, photographs and videos.

- Appreciate human achievements and aspirations – a sense of 'awe and wonder'.
- Know and remember more.

For the best impact we intend that we have:

- A clearly defined, high quality curriculum
- Effective delivery
- The curriculum being taught and learned as intended

The successful approach in Science at Holly Park results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. We want to empower our children so they understand they have the capability to change the world. Children will know more, remember more and understand more about the curriculum. Children retain prior-learning and explicitly make connections between what they have previously learned and what they are currently learning. This is evidenced in a range of ways, including pupil voice, their work and their overwhelming enjoyment for science.

All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills
- A richer vocabulary which will enable them to articulate their understanding of taught concepts
- Confidence and a love of learning for all things science

Subject Strategy

In lower KS2 the focus of science teaching in key stage 2 is to enable pupils to broaden their scientific view of the world around them. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

In upper KS2 the focus of science teaching is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. The children should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

SCIENCE PEDAGOGY

- Children respect each other's thoughts, beliefs and personal experiences.
- Children feel confident to share their ideas in science without judgment.
- We have high expectations of children when handling and using science equipment and resources in the classroom.
- We have high expectations of children's knowledge no matter their starting point.
- We use enquiry questions to develop children's curiosity and understanding.
- We allow children the opportunity to reflect on prior learning through their inter-key stage books, recapping and making links to previous topics.
- We make explicit links between science topics.
- Children have opportunities to explore through talk and discussion.
- We provide children with the key scientific vocabulary.

Subject Strategy

- We model appropriate behaviour and handling of the science equipment and resources.
- We have opportunities for children to have first-hand experiences through live science experiments.
- We use direct questioning to assess understanding and dig up misconceptions.
- We provide whole class and individual feedback, framed with positivity, to move the children forwards.
- We encourage children to reflect on their own scientific learning and identify their next steps.