Science at Old Park Primary and Nursery School

"In science, pupils understand the need for a fair test, make sensible predictions, measure accurately and draw appropriate conclusions."

(OFSTED 2017)

At Old Park, we create a sense of excitement, curiosity and intrigue within the subjects of biology, physics and chemistry. We strive to enable all children to work scientifically and explain their understanding of various scientific concepts and theories. We believe that science encompasses the acquisition of knowledge, concepts, skills and positive attitudes and through teacher and child led sessions we strive to achieve these.
Teachers are equipped with the knowledge of previous, current and future year group objectives, following the progression grids for biology, physics and chemistry. This allows for a good understanding of subject content and scientific understanding for all teaching staff. Scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school.

The different key stages have a working scientifically section of their learning, which enables children of all ages and abilities to predict, carry out and explain causes and effects of their questions. From the Early Years to Upper Key Stage 2, the following elements will be taught throughout:

EYFS

Birth – 3 years

Repeat actions that have an effect.
Explore materials with different properties
Explore natural materials, indoors and outside
Explore and respond to different natural phenomena in their setting and on trips

3-4 years

Use all their senses in hands-on exploration of natural materials
Explore collections of materials with similar and/or different properties
Talk about what they see, using a wide vocabulary
Show interest in different occupations
Explore how things work
Plant seeds and care for growing plants
Understand the key features of the life cycle of a plant and an animal
Begin to understand the need to respect and care for the natural environment and all living things
Explore and talk about different forces they can feel
Talk about the differences between materials and changes they notice

Reception

Explore the natural world around us
Describe what they see, hear and feel whilst outside
Recognise some environments that are different to the one in which they live
Understand the effect of changing seasons on the natural world around them

Early Learning Goals

Explore the natural world around them, making observations and drawing pictures of animals and plants
Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class
Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter

Key Stage 1

Asking simple questions and recognising that they can be answered in different ways

Observing closely, using simple equipment

Performing simple tests

Identifying and classifying

Using their observations and ideas to suggest answers to questions

Gathering and recording data to help in answering questions

Lower Key Stage 2

Ask relevant questions and using different types of scientific enquiries to answer them

Setting up simple practical enquiries, comparative and fair tests

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Identifying differences, similarities or changes related to simple scientific ideas and processes

Using straightforward scientific evidence to answer questions or to support their findings

Upper Key Stage 2

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where available

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

Using test results to make predictions to set up further comparative and fair tests

Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

Identifying scientific evidence that has been used to support or refute ideas or arguments

The implementation of science at Old Park Primary School

Staff plan Science sessions to build on previous knowledge. Where appropriate, the pupils also lead sessions or periods of sessions. As much as possible, sessions are linked in a cross curricular way with other subjects. This way of teaching and learning enables the achievement of greater depth of knowledge.

We use the Cornerstones scheme as core of our planning in science. Focused investigations and problem solving opportunities are planned which allow children to apply and extend their knowledge. With these newly learnt skills, the pupils investigate their own questions and find out answers for themselves. Teachers use a range of open and closed questioning in individual, group and class led discussions, which allow them to test conceptual knowledge and skills, as well as assess pupils to identify any gaps in their learning.

Teachers demonstrate how to use scientific equipment and the various Working Scientifically skills in order to develop and embed scientific knowledge and understanding. This is expanded through the years, in-keeping with the various biology, physics and chemistry sessions. Teachers also find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.

Children are given the opportunity to broaden their understanding of biology, physics and chemistry with various extra-curricular activities, including clubs, trips and visitors. These are well planned and purposeful, linking with the knowledge being taught in class.

Year groups	The areas implemented across the science curriculum				
Year 1	Plants	Animals, including humans	Everyday materials	Seasonal changes	
Year 2	Plants	Animals, including humans	Living things and their habitats	Uses of everyday materials	
Year 3	Plants	Animals, including humans	Rocks	Light	Forces and magnets
Year 4	Living things and their habitats	Animals, including humans	States of matter	Sound	Electricity
Year 5	Living things and their habitats	Animals, including humans	Properties and changes of materials	Earth and space	Forces
Year 6	Living things and their habitats	Animals, including humans	Evolution and inheritance	Light	Electricity

The impact of science at Old Park Primary and Nursery School

With an engaging and stimulating science curriculum and a challenging and well enabled classroom, the children of Old Park Primary will achieve age related expectations in Science at the end of their cohort year. With the use of progression grids and a transfer of knowledge from year to year, children will be more equipped to retain knowledge that is pertinent to Science with a real life context. Children will be able to question ideas of their own and others and reflect on the knowledge they have gained. With a sequence of intent and a good starting point, children will work collaboratively and practically to investigate and carry out experiments. Children will be more able to explain the process they have taken and be able to reason scientifically, using scientific language and methods of recording.