



Lord Blyton Primary School

Science- Intent, Implementation, Impact Statement

Science Statement of Intent

At Lord Blyton, we recognise how science impacts every aspect of daily life, and without science humankind would not have made progress throughout history. As one of the core subjects taught at primary level, we give the teaching and learning of science the prominence it deserves.

Learning science is concerned with increasing pupils' knowledge of our world, and with developing skills associated with science as a process of enquiry. Our science curriculum develops the natural curiosity of each child no matter their demographic, encourages them to have respect for living organisms, and instil in pupils the importance of caring for the natural environment. We are currently committed to using the Kapow scheme of work in order to deliver a broad and balanced science curriculum following the National Curriculum objectives.

Meaningful links or connections are made with other subjects wherever appropriate, including: Art, Music, History, English, Maths and Geography and these links develop our overarching learning. Our scheme of work is coherently planned and sequenced towards sufficient substantive and disciplinary knowledge for future learning.

Substantive Knowledge: this is the concepts, laws, theories and models which are referred to in the National Curriculum as 'scientific knowledge and conceptual understanding'. Substantive knowledge is the established facts e.g. 'The Earth is the planet on which we live.' Substantive knowledge in science is organised into the 3 subject disciplines: biology, chemistry and physics.

Disciplinary Knowledge: this is referred to in the National Curriculum as 'working scientifically' and it includes knowing how to carry out practical procedures. Disciplinary knowledge in science is the methods that establish the substantive facts e.g. 'observation of the sun, moon and stars, satellite photographs.'

By learning substantive and disciplinary knowledge, pupils not only know 'the science'; they also know the evidence for it and how this evidence is gained. New knowledge is built on what has been previously taught while working towards clearly defined end points. When units are repeated throughout the school, vocabulary and knowledge is revisited and it progresses to challenge the children's thinking further as well as introducing new ideas and material.

Science Lessons

Using the requirements of the Science National Curriculum as our guide, our Science lessons offer opportunities for children to:

- Develop scientific knowledge and conceptual understanding of the disciplines of Physics, Chemistry and Biology.
- Formulate their own questions about the natural world.
- Foster the confidence to 'be wrong' when it comes to making predictions and postulating their own theories.
- Promote an awareness of the importance of teamwork in scientific experimentation.
- Practically investigate their questions using various methods of enquiry.
- Gain competence in the science skills of planning scientific investigations, gathering and analysing data and critical evaluation of investigations across the disciplines.
- Use a range of methods to gather data from investigations and secondary sources including I.C.T., drawings, diagrams, videos and photographs.
- Present data in a variety of methods including tables, bar charts, line graphs, pictograms and pie charts.
- Produce comprehensive science reports that demonstrate their proficiency in the scientific method.



- Have care for the safety of all individuals in lessons by developing knowledge of the hazards of the materials and equipment they handle, along with mitigating these hazards.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

Teacher improvement

Our teachers are encouraged to continually improve their knowledge and practical competence by:

- Having access to CPD videos that cover every area of the National Curriculum.
- Having a minimum of one science lesson observation per school year with feedback.
- Attending science themed staff meetings per school year.
- Inspection of pupil work via scrutiny of book work and learning walks.
- Termly analysis of pupil progress in science.
- Pupil Voice and Pupil Interviews.

Science Coordinator Role

The school has appointed a science coordinator whose responsibility it is to oversee the science function of the school. They will:

- 1) Strive to continually improve all aspects of the school's science function.
- 2) Control the budget allocated to the science function.
- 3) Complete annual audit of resources and keep records of these.
- 4) Purchase sufficient resources that allows the school to adhere to the principles as set out in the 'Science Lessons' section above.
- 5) Monitor the impact of the Kapow scheme by assessing and tracking pupil progress
- 6) If necessary, approve personalised remedial actions for pupils who fall behind.
- 7) Improve their own practical and technical knowledge of science.
- 8) Conduct annual reviews of the school's science provision.
- 9) Communicate with teaching staff when necessary.
- 10) Report to the Senior Leadership Team.

At Lord Blyton:

Children have weekly lessons in Science throughout the school. Key Stage 1 lessons last for 1/1.5 hours, and KS2 lessons 2 hours, using various programmes of study and resources. Kapow Primary Science lessons are designed to be 1 hour and 30 minutes long to reflect the requirements of a core subject. In Early years, science is taught through the children learning by play and through practical tasks and activities. Additional opportunities are provided in Science, such as educational visits, participation in various STEM events, participation in British Science Week, science/STEM club etc.

We endeavour to ensure that the Science curriculum we provide will give children the confidence and motivation to continue to further develop their skills into the next stage of their education and life experiences.

Intent

At Lord Blyton, we follow the Kapow scheme for Science. Kapow Primary's Science curriculum aims to develop a sense of excitement and curiosity about natural phenomena and an understanding of how the scientific community contributes to our past, present and future. We want pupils to develop a complex knowledge of Biology, Chemistry and Physics, but also adopt a broad range of skills in working scientifically and beyond. The scheme of work is inclusive and meaningful, so all pupils may experience the joy of science and make associations between their science learning and their lives outside the classroom. Studying science allows children to appreciate how new knowledge and skills can be fundamental to solving arising global challenges. Our curriculum aims to encourage



critical thinking and empower pupils to question the hows and whys of the world around them. Our scheme encourages:

- A strong focus on developing knowledge alongside scientific skills across Biology, Chemistry and Physics.
- Curiosity and excitement about familiar and unknown observations.
- Challenging misconceptions and demystifying truths.
- Continuous progression by building on practical and investigative skills across all units.
- Critical thinking, with the ability to ask perceptive questions and explain and analyse evidence.
- Development of scientific literacy using wide-ranging, specialist vocabulary.

Kapow Primary's Science scheme of work enables pupils to meet the end of key stage attainment targets in the National curriculum and the aims also align with those set out in the National curriculum.

Implementation

In order to meet the aims of the National curriculum for Science and in response to the Ofsted Research review into Science, we have identified the following key strands:

- Scientific knowledge and understanding of:
 - Biology - living organisms and vital processes.
 - Chemistry - matter and its properties.
 - Physics - how the world we live in 'works'.
- Working scientifically - processes and methods of science to answer questions about the world around us.
- Science in action - uses and implications of science in the past, present and for the future.

Kapow Primary's Science scheme is a spiral curriculum, with essential knowledge and skills revisited with increasing complexity, allowing pupils to revise and build on their previous learning. A range of engaging recall activities promote frequent pupil reflection on prior learning, ensuring new learning is approached with confidence. The Science in action strand is interwoven throughout the scheme to make the concepts and skills relevant to pupils and inspiring for future application. Cross-curricular links are included throughout each unit, allowing children to make connections and apply their Science skills to other areas of learning. Each unit is based upon one of the key science disciplines; Biology, Chemistry and Physics and to show progression throughout the school we have grouped the National curriculum content into six key areas of science:

- Plants
- Animals, including humans
- Living things and habitats
- Materials
- Energy
- Forces, Earth and space.

Pupils explore knowledge and conceptual understanding through engaging activities and an introduction to relevant specialist vocabulary. As suggested in Ofsted's Science research review (April 2021), the 'working scientifically' skills are integrated with conceptual understanding rather than taught discretely. This provides frequent, but relevant, opportunities for developing scientific enquiry skills. The scheme utilises practical activities that aid in the progression of individual skills and also provides opportunities for full investigations.

Implementation

Each year group has an optional exploratory 'Making connections' unit that delves beyond the essential curriculum, assimilating prior knowledge and skills to evoke excitement and to provide an additional method of assessing



scientific attainment. Lessons incorporate various teaching strategies from independent tasks to paired and group work, including practical, creative, computer-based and collaborative tasks. This variety means that lessons are engaging and appeal to those with different learning styles. In Year 1, we have tried to ease the transition into Key stage 1, by providing a selection of activities: some adult-led, some independent tasks, and some tasks that can be used during continuous provision to suit your set-up. Guidance for adapting the learning is available for every lesson to ensure that all pupils can access learning, and opportunities to stretch pupils' learning are available when required. Knowledge organisers for each unit help to identify prior and future curriculum links to make the scheme as meaningful as possible and reinforce key technical terms. Strong subject knowledge is vital for staff to deliver a highly effective and robust Science curriculum. Each unit of lessons includes multiple teacher videos and resources to develop subject knowledge, target fundamental misconceptions effectively and support ongoing CPD. Kapow has been created to build confidence amongst non-specialist primary teachers who are required to deliver and assess the full Science curriculum and maximise pupil progression. Videos created by subject specialists feature troubleshooting advice for practical work that does not go to plan, suggested questioning and support for tackling misconceptions, as well as recordings of practical tasks that can be utilised as demonstrations in the classroom or to support pupil reflection on their own observations.