Respect
Effort
Achieve
Communicate
Happy and Healthy

the link school
Sunderland

Science Policy

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Signature of Chair of Management Committee:	
To be reviewed:	At the discretion of the Head Teacher

Introduction

This policy outlines the teaching and learning, organisation and management of the Science taught at The Link School. The school's policy for Science is underpinned by The National Curriculum 2015 Guidelines (Key Stage 1 through 4) and the Statutory Framework for The Early Years Foundation Stage 2021 (EYFS).

Our ***high-quality science education*** provides the foundations for understanding the world through the specific disciplines of ***biology***, ***chemistry*** and ***physics***. Science has changed our lives and is vital to the world's future prosperity, and ***all pupils are taught essential aspects of the knowledge, methods, processes and uses of science***. Through building up a body of key foundational knowledge and concepts, our *pupils are encouraged* to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, analyse causes and ***develop the thinking skills to become scientific literate citizens***.

Teaching and learning of Science at The Link School is ***reflective, adaptive, accessible yet ambitious and personalised to the changing needs of our learners***.

Aims

- ✓ Inspire and develop pupils' enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life
- ✓ Nurture and build on pupils' curiosity and sense of awe of the natural world
- ✓ Plan and deliver a range of investigations and practical activities to allow pupils the opportunity for greater understanding of the concepts and knowledge of science
- ✓ Introduce pupils to scientific language and vocabulary - both reading and spelling - at a level consistent with their Key Stage
- ✓ Develop pupils' practical skills and their ability to make accurate and appropriate measurements
- ✓ Develop pupils, use of ICT, Maths and Literacy in their study of Science
- ✓ Support pupils to develop their natural sense of enquiry, encouraging them to question and challenge ideas
- ✓ Extend the learning beyond the classroom environment when appropriate, giving pupils the opportunity to relate scientific concepts to real life applications
- ✓ Facilitate consistent teaching and learning and progression through Remote Learning platforms when necessary
- ✓ Create an environment that effectively breaks down the barriers to learning, enabling our pupils to achieve individual excellence
- ✓ Raise aspirations so our pupils have the confidence and skills in preparation for their next life stage
- ✓ Promote emotional well-being, resilience and a 'Happy and Healthy' lifestyle for our pupils

Objectives

Our Science Schemes of Learning are reflective documents and reviewed as the needs of our pupils, and their world around them change. They consider but are not restricted by the 2015/2021 guidelines; offering our pupils an accessible yet ambitious curriculum across all Key Stages.

Continuity and progression through the Key Stages play an integral part in the planning of our Programmes of learning. Pupils scientific skills and knowledge gained at EYFS and Key Stage 1 are consolidated and developed through Key Stage 2 and furthermore in to Key Stage 3 and 4 where our pupils will work towards achieving their GCSE in Science.

Our science provision includes the study of Science, Technology, Engineering and Maths (STEM) across all Key Stage. Key Stage 1 and 2 pupils will be regularly introduced to STEM activities, embedded within the Programmes of Learning. Through Key Stage 3 and 4 STEM will allow for work based opportunities both internally and externally with key partners highlighting career opportunities post-16.

Early Years Foundation Stage

'Understanding the world' at EYFS involves guiding our pupils to make sense of their physical world and their community. By giving our pupils a range of personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Our pupils at EYFS will be supported to reach Early Learning Goals (ELG) outlined by the 2021 guidelines. Pupils will:

- ✓ 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 (Years 1 and 2)

Our principal focus of science teaching in key stage 1 is to enable our pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. Our pupils are encouraged to be curious and ask questions about what they notice. They are supported 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. Our pupils are guided 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 science learning at this stage is through the use of first-hand practical experiences, but we also include the use of appropriate secondary sources, such as books, photographs and videos.

During years 1 and 2, our pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of learning content:

- ✓ 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 (Years 3 and 4)

Our principal focus of science teaching in lower Key Stage 2 is to enable our 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. Our pupils are encouraged and supported to 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 are taught the skills needed to draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

During years 3 and 4, our pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of learning content:

- ✓ asking 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 (Years 5 and 6)

Our principal focus of science teaching in upper Key Stage 2 is to enable our pupils to develop a deeper understanding of a wide range of scientific ideas. They do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.

At upper Key Stage 2, our pupils encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They also begin to recognise that scientific ideas change and develop over time. They develop the skills to 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. Our pupils 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.

During years 5 and 6, our pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- ✓ 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 when appropriate
- ✓ 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, causal relationships and explanations of and a 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

Key Stage 3 (Years 7, 8 and 9)

Our principal focus of science teaching in key stage 3 is to develop a deeper understanding of a range of scientific ideas in the subject disciplines of biology, chemistry and physics. Our pupils begin to see the connections between these subject areas and become aware of some of the big ideas underpinning scientific knowledge and understanding. Examples of these big ideas are the links between structure and function in living organisms, the particulate model as the key to understanding the properties and interactions of matter in all its forms, and the resources and means of transfer of energy as key determinants of all of these interactions. Our pupils are encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Our pupils develop the understanding that science is about working objectively, modifying explanations to take account of new evidence and ideas and subjecting results to peer review. Pupils develop the skills to decide on the appropriate type of scientific enquiry to undertake to answer their own questions and develop a deeper understanding of factors to be taken into account when collecting, recording and processing data. They evaluate their results and identify further questions arising from them.

Through the content across all three disciplines (biology, chemistry and physics), our pupils are taught: *Scientific Attitudes*, *Experimental skills and investigations*, *Analysis and Evaluation*, and *Measurement.*

Key Stage 4 (Years 10 and 11)

Teaching in the science in key stage 4 continues with the process of building upon and deepening scientific knowledge and the understanding of ideas developed in earlier key stages in the subject disciplines of biology, chemistry and physics.

Science is changing our lives - this has never been more clear than in the last 18 months - and is vital to the world's future prosperity. All pupils are taught essential aspects of the knowledge, methods, processes and uses of science. They are helped to appreciate the achievements of science in showing how the complex and diverse phenomena of the natural world can be described in terms of a number of key ideas relating to the sciences which are inter-linked, and which are of universal application. Science is taught in ways that ensure our pupils have the knowledge to enable them to continue to develop curiosity about the natural work, insight into working scientifically, and appreciation of the relevance of science to their everyday lives; becoming scientific literate citizens.

Teaching and learning at key stage 4 comprises approximately equal proportions of biology, chemistry and physics. It is broad, coherent, practical and rigorous, so that students are inspired and challenged by the subject and its achievements.

Equal Opportunities and Inclusion

All of our pupils have equal access to the science curriculum and its associated practical activities. The Science Lead, Teachers and Teaching Assistants are responsible for ensuring that all children, irrespective of gender, learning ability, physical disability, ethnicity and social circumstances, have access to the whole curriculum and make the greatest possible progress.

We respect the fact that all children:

- have different educational and behavioural needs and aspirations
- require different strategies for learning
- acquire, assimilate and communicate information at different rates
- need a range of different teaching approaches and experiences

Teachers respond to children's needs by:

- ✓ providing support for learners who need help with communication, language and literacy
- ✓ planning to develop children's understanding through the use of all available senses and experiences
- ✓ planning for children's full participation in learning, and in physical and practical activities
- ✓ helping learners to manage and own their behaviour and to take part in learning effectively and safely
- ✓ helping individuals to manage their emotions, particularly trauma or stress, and to take part in learning
- ✓ providing both support and challenge for all our pupils

Science pervades every aspect of our lives and we will relate it to all areas of the curriculum. We ensure that pupils recognise the contribution of all genders to the world of science and the contribution of those from other cultures, ensuring that these differences are reflected positively in the teaching materials used. Pupils will not only recognise the positive effects of science on the world but also include the problems, negative impact and issues for which some human activities are responsible.

Health and Safety

The Link School is responsible for teaching Science in a healthy and safe environment with reference to appropriate risk assessment for activities likely to incur risk, across all sites and Key Stages. All pupils are taught to use scientific equipment in the correct manner. All science equipment is stored safely and is subject to maintenance and safety checks and any faulty equipment reported to Head of Science or Head of School. As a school, we ensure that issues of health and safety are addressed in the planning and delivery of the science curriculum.

Assessment for Learning, marking, recording and reporting

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of learning. There is an expectation that pupils will make progress at the same rate as their peers at mainstream school taking in to consideration their starting points and individual needs.

Teachers will carry out diagnostic assessments to identify pupil's strengths and areas for development. We use outcomes from these assessments to plan future work and to identify groups of children who need support. This process also helps us with our target setting and to reflect on teaching and learning strategies

which we use. Assessment for Learning is the day to day ongoing assessment to enable teachers to identify the next steps in a pupils' learning and to enable pupils to have greater involvement and responsibility for their own learning. Key strategies used to ensure good formative assessment takes place include observation, discussion, questioning, paired response work and quality marking.

Reporting to parents/carers includes termly home visits, sharing results and new targets, regular SA reviews - with SENDCO, teachers and parents/carers - regular phone contact, PEP for LAC children, daily home/school diaries, and reintegration meetings.

Much of the work done in science is of a practical or oral nature and, as such, recording will take many varied forms. Written work is marked regularly and clearly, as an aid to progression and to celebrate achievement. When appropriate, pupils may be asked to self-assess or peer assess their own or other's work. Marking for improvement comments in a pupil's book will be relevant to the learning objective to help learners to better focus on future targets.

(More information can be found in the School Assessment, Marking and Feedback Policy)