



LORD BLYTON PRIMARY SCHOOL **STEM POLICY**

Statement of Intent:

The aim of teaching STEM is to inspire and engage our children, and to prepare them for their future life and career path. Children at Lord Blyton are provided with the foundations required to understand the world around them and are encouraged to recognise the impact that advances in science has upon technology. Through building up a body of foundational knowledge, pupils are encouraged to develop a sense of excitement and curiosity about natural phenomena. We teach children to partake in different types of scientific enquiry and to pose and answer scientific questions about the world around them. We then demonstrate how that knowledge can be applied in real life engineering situations to pose a solution to a problem. Children are then able to use their knowledge, gained through scientific research, to their own design and technology projects in a practical environment.

Intent of STEM teaching:

- To prepare children for a STEM focussed career/ future
- To inspire and engage children in STEM subjects
- To inspire the future scientists and engineers

Science:

- To teach children to ask question and planning lines of investigative enquiry
- To extend children's natural curiosity and wonder about the world
- To help children make decisions concerning environmental, moral and social issues
- To develop scientific strategies and skills
- To work co-operatively and communicate scientific ideas to others

Technology and Engineering: (See separate D&T yearly overview)

- To develop an understanding of technological processes, products and their manufacture, and their contribution to our society
- To develop imaginative thinking in children and to enable them to talk about what they like and dislike when designing and making
- To enable children to talk about how things work, and to draw and model their ideas
- To encourage children to select appropriate tools and techniques for making a product, whilst following safe procedures
- To explore attitudes towards the made world and how we live and work within it
- Children should learn to understand and apply the principles of nutrition and learn how to cook.

Mathematics: (See separate mathematics policy)

- To apply mathematics during engineering design challenges
- To develop critical thinking, problem solving, and communication skills
- To prepare students to solve problems in class and at home.

Research suggests that Years 3 to 8 is the time frame within which children form their opinions towards subjects like STEM. Providing opportunities early on and encouraging children to explore real world STEM is the most effective

way of building children's engagement, and actively engaging them in activities which will help them in their future career paths.

IMPLEMENTATION OF SCIENCE/STEM POLICY

Our science policy follows the National Curriculum for science guidelines and aims to ensure that all pupils:

- 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;
- ensures that our pupils are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future

PURPOSE

- To ensure that teachers meet their statutory obligations with regards to the teaching of science.
- To raise science standards by promoting a high standard of excellence and consistency of approach amongst all staff.
- To ensure procedures for planning and assessment enable a broad and balanced curriculum that has continuity and progression and addresses equal opportunities.
- To foster a positive attitude to science as an interesting and exciting part of the curriculum.
- To foster in children the confidence to apply their knowledge, skills and ideas in real life contexts both within and outside the classroom and become aware of the uses of science in the wider world.
- To provide children with scientific experiences that develop their understanding of themselves and the world in which they live.
- To develop the enquiry skills of predicting, asking questions, making inferences, concluding and evaluating based on evidence and understanding and use these skills in investigative work.
- To introduce and extend children's knowledge and understanding and know that scientific ideas change and are modified.
- To develop the ability of pupils to communicate their ideas using appropriate scientific vocabulary.
- To encourage safe practice in all areas of science.
- To help provide pupils with the competence and confidence to deal with a life in an increasingly scientifically complex society.

GUIDELINES

- There will be weekly dedicated science lessons (years 1-6).
- Science is to be used in other curriculum areas, when appropriate, to help consolidate science concepts and skills.
- Children will be introduced to the appropriate and varied scientific vocabulary.
- In EYFS the development of scientific thought is an important area of experience. Learning should be active, part of the continuous provision, and bearing in mind the requirements of the EYFS curriculum guidance.
- Materials and equipment required for the delivery of the science curriculum will be available in a central location.

- Staff will track back and forwards to identify appropriate differentiated tasks to support the teaching and learning of science
- Teachers need to explicitly teach the process skills for investigations e.g. observing, planning, predicting etc.
- Teaching should make use of direct first-hand experience whenever possible.
- There should be opportunities for cross-curricular links.
- Curriculum topics will be planned that incorporate the scientific objectives where appropriate

TEACHING AND LEARNING

Science is taught on a weekly basis from Y1 to Y6. Where possible, it is supported/enhanced through other curriculum areas. In EYFS/ Reception, science forms the basis of one of the seven areas of learning ('Knowledge and Understanding of the World' and 'Expressive Arts & Design'). KS1 and KS2 use the Primary National Curriculum and PZAZ scheme as a basis for planning within the subject. Teachers use a variety of interactive teaching methods to deliver the curriculum and achieve set learning objectives.

Key features of science include:

- Lessons are included and detailed in weekly planning
- Appropriate pace of learning is in place and high expectations maintained
- Account is taken of pupils' prior learning
- High standards of presentation are expected
- Pupils are regularly given opportunities to plan, predict, investigate and evaluate different types of practical activities.
- Good use is made of a wide range of resources
- Pupils are praised effectively to encourage and motivate them and are well supported according to their needs
- ICT is used to enhance learning and teaching experiences
- Pupils are aware of the importance of scientific work to everyday life and make relevant links
- Pupils are encouraged to share responsibility for their own learning

RECORDING

Scientific work should be recorded by the children in a variety of ways e.g. drawings, scribed or verbal, recordings in pupil books, graphs, photographs, diagrams and should suit the requirements of the task set.

CURRICULUM

Each class are taught the National Curriculum programme of study for science and DT which is set out year-by-year for key stages 1 and 2. At Lord Blyton, we follow the PZAZ scheme of work for science and the Kapow scheme of work for DT which both outline how to cover the National Curriculum objectives.

Lord Blyton Primary School
Science- Whole School Overview

| Year Group | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 SCIENCE WEEK | Summer 1 | Summer 2 |
|----------------------|---|--------------------------|---|---------------------------------|-------------------------------------|--------------------------|
| EYFS | | | | | | |
| Key Stage One | | | | | | |
| 1 | Materials Seasonal change (ongoing) | | Animals including Humans Seasonal change (ongoing) | | Plants Seasonal change (ongoing) | |
| 2 | Materials | Animals including Humans | Plants/ Living Things | | Materials/ Revision & Enquiry | |
| Key Stage Two | | | | | | |
| 3 | Rocks | Animals including Humans | Forces | Revision & Enquiry | Plants | Light |
| 4 | States of Materials | Animals including Humans | Living Things | Revision & Enquiry | Electricity | Sound |
| 5 | Changing Materials | Earth & Space | Forces | Revision & Enquiry | Living Things & their Habitats | Animals including Humans |
| 6 | Light | Animals including Humans | Evolution & Inheritance | Revision & Enquiry | Living Things & their Habitats | Electricity |

Rationale- Materials topic first so the children can make explicit links to their D&T

The **Working Scientifically** strand of the National Curriculum is not taught separately; it is integrated throughout the whole science curriculum. Every science lesson should aim to develop one or more of these skills.

| Working Scientifically |
|---|
| KS1 |
| Asking simple questions Observing closely, using simple equipment Performing tests Identifying and classifying Using their observations and ideas to suggest answers to questions Gathering and recording data to help in answering questions. |
| Lower KS2 |

| |
|---|
| Asking relevant questions and using different types of scientific enquiries Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations Gathering, recording, classifying and presenting data Recording findings Reporting on findings from enquiries Using results to draw simple conclusions, make predictions and raise further questions Identifying differences, similarities or changes Using straightforward scientific evidence to answer questions |
| Upper KS2 |
| Planning different types of scientific enquiries to answer questions Taking measurements, using a range of scientific equipment Recording data and results Using test results to make predictions, to set up further comparative and fair tests Reporting and presenting findings from enquiries Identifying scientific evidence that has been used to support or refute ideas or arguments |

Lord Blyton Primary School

Design Technology

| Year Group | Autumn 1 | Autumn 2 | Spring 1 | Spring 2- SCIENCE WEEK | Summer 1 | Summer 2 |
|----------------------|---------------------------------------|---|--|---|----------|---|
| EYFS | | | | | | |
| | DT Cooking & Nutrition- Soup | | Structures – junk modelling Boat for the Gingerbread Man | Flowers sculptures / crafts | | Structures - Make a Kite plastic bags |
| Key Stage One | | | | | | |
| 1 | | Mechanisms- Making a Moving Story Book | | Food: Fruit and Vegetables Structures- Constructing a Windmill | | Textiles- Puppets |
| 2 | | Mechanisms- Making a Moving Monster/ Fairground Wheel PRIMARY ENGINEER PROJECT | | Food: A Balanced Diet Structures: Baby Bear’s Chair | | Textiles: Pouches |
| Key Stage Two | | | | | | |
| 3 | | Mechanical Systems: Pneumatic | | Food: Eating Seasonally | | Textiles: Cushions/ Egyptian |

| | | | | | | |
|---|--|---|--|---|--|---------------------------|
| | | Toys | | Structures: Constructing a Castle | | Collars |
| 4 | | Mechanical Systems: Making a Slingshot Car | | Food: Adapting a Recipe Structures: Pavilions | | Textiles: Fastenings |
| 5 | | Mechanical Systems: Making a Popup Book PRIMARY ENGINEER PROJECT | | Food: What Could be Healthier Structures: Bridges | | Textiles: Stuffed Toys |
| 6 | | Mechanical Systems: Automata Toys | | Food: Come Dine with Me Structures: Playgrounds | | Textiles: Waistcoats |

Additional Information

KS2 Electrical Systems & Digital World- objectives covered through a visit to the Word (Computing) and ongoing participation in the Primary Engineering project.

In Year 2 and Year 5, participation in the Primary Engineering project may replace the mechanisms/ mechanical systems DT during academic year 2023/2024

ASSESSMENT

- It is necessary to be constantly evaluating what individuals and groups are learning and what they bring to the learning situation. Through evaluation, any difficulties can be identified and specific help to remedy the problem can be given.
- Evidence of children's work may be kept in the form of teacher's notes, Children's drawings, plans, photographs, construction models, writing etc.
- Feedback to pupils about the progress in science is achieved through the marking of work (see marking policy).
- Pre/ Post topic assessments are completed to inform assessment judgements.

MONITORING AND EVALUATION

The subject leader follows the School Self Evaluation for Subject Leaders' Guidelines and is achieved through;

- monitoring and evaluation of pupils' work
- lesson observations
- monitoring of planning

- work sampling
- book scrutiny
- discussions with staff and pupils

ORGANISATION OF STEM

The STEM curriculum is organised within science schemes of work and separate design and technology schemes of work (PZAZ/ Kapow), which both compliment and support the other. **(See separate D&T yearly overview)**

The science curriculum is arranged in a fixed yearly cycle, as specified by the National Curriculum. In both Key Stage 1 and Key Stage 2, science is taught on a weekly basis by the class teacher. Embedded within the science topics is a technology project. During each project, pupils will apply the scientific knowledge they have acquired, with practical, technology focussed projects.

ICT

The use of ICT during lessons should support the concentration of children during science lessons. Teachers need to exploit opportunities to incorporate ICT into the teaching and learning of science. Teachers should also make use of material available on the internet for planning and delivering science lessons.

- ICT can play an important role in supporting science but it should not be a substitute for practical science.
- Use I-Pad's, laptops and the Internet as a research tool.
- Use of graphing packages
- Using word processing facilities to speed the writing of results through frames
- Data logging software.

LANGUAGE

The National Curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum- cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. Teachers need to be aware and use the correct scientific vocabulary at all times. Children need to be encouraged to understand and use the appropriate terminology when presenting a scientific justification, argument or proof. Key vocabulary is selected from the science framework and included within weekly planning and during lessons. **(See separate scientific vocabulary document)**

INCLUSION

At Lord Blyton, teachers set high expectations for every pupil. They aim to plan stretching work for pupils whose attainment is significantly above expected standard. They also have an obligation to plan lessons for pupils who have low levels of prior attainment or come from disadvantaged backgrounds. Teachers use appropriate formative assessment to set targets which are relevant to the needs of all pupils.

IMPACT

The impact and measure of this is to ensure students not only acquire the appropriate age-related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives. Our aim for science/STEM is to increase the skills needed to navigate an ever-changing world of science and technology by immersing our students with scientific enquiry skills, key scientific knowledge and investigative skills. We aim to create a culture of high scientific aspirations, which will allow our students a platform to develop their scientific learning and careers, and to articulate their understanding of key scientific concepts.