



Science at Lingham Primary School

Intent

At Lingham Primary, we are committed to ensuring our Science Curriculum is fully inclusive for every child. The curriculum is carefully designed to ensure all children receive a broad, balanced and differentiated curriculum. Science at Lingham Primary School is about developing children's ideas and ways of working that enable them to ask and answer questions in order to make sense of the world in which they live through investigation and using and applying skills for different processes.

Our Science curriculum encompasses the British Values, alongside our school values, wherever possible, making meaningful connections and authentic links (for example we ensure democracy is upheld when carrying out scientific enquiries in groups and individual liberty is showcased when children are given independence to undertake their investigative work). Our Science curriculum has been carefully crafted to ensure a progressive development of scientific concepts, knowledge and skills.

Science helps pupils to understand the natural world around us, the process of changes to our planet, and theories behind why certain phenomena occur. Whenever possible we link this learning to global citizenship (for example caring for our planet through looking at materials and respecting the living plants and animals around us as well caring for our own bodies and health through the study of different systems). We complement this learning in Science through the study of high quality children's literature to further develop understanding of different topic areas.

Teaching and Learning of Science

Science is a core subject in the National Curriculum. The fundamental skills, knowledge and concepts of the subjects are currently set out in 'Science in the National Curriculum'

Working scientifically is described separately in the programme of study, but will be taught through, and clearly related to, the science content in the programme of study. This will be embedded within the content of biology, chemistry and physics.

Pupils at our school will be taught to use a variety of approaches to answer relevant scientific questions. The types of enquiry will include:

Observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing

Spoken language will be developed through science, and children will be assisted in making their thinking clear to themselves and others.

Foundation classes are taught the required science elements of the foundation stage document through cross curricular themes.

Our high quality Science curriculum is designed to inspire curiosity and fascination about the wider world around us and our teaching equips pupils with knowledge about a broad range of topic areas that is also led by the children's interests. We want children to love learning about science through experiences in the classroom alongside fieldwork and carefully considered educational visits.

The development and understanding of high level vocabulary is central to our whole school curriculum and in science we strive to develop a scientifically grounded understanding of scientific facts, ideas and theories. Through a retrieval based approach within each lesson, children are provided with further opportunities to embed their prior learning. As a result of these strategies, children are able

to make connections within the science curriculum they have been exposed to throughout their primary years.

Each year group has mapped out their Science curriculum, alongside the Subject Leader and SLT, to ensure our offer at Lingham meets the needs of our intended curriculum. Further details can be found in our Subject on a Page documents- see appendices.

Implementation

Science is taught weekly by class teachers focusing on the knowledge and skills stated in the National Curriculum. Skills have been carefully mapped out to ensure there is clear progression from FS to Year 6 (see appendices).

All children are provided with opportunities to gain 'real-life' experiences as part of our Science Curriculum to help them embed their knowledge and extend their learning. We also use the local area where possible for example using the forest school area to understand living things and their habitats when undertaking classification, walking the local area for sound collection data and utilising the field and links with P.E to investigate pulse rate,

We support children to embed their substantive and disciplinary knowledge from previous topics through weekly retrieval and endeavour to make connections between areas of Science (and other curriculum areas) in a variety of ways, for example, direct comparisons in teaching, high quality displays, quizzes and revisiting topics through texts (e.g children are expected to build upon their understanding of the human body's systems and therefore they revise each of these systems and their purposes in year 6 before they are introduced to the circulatory system).

Staff CPD has been a crucial element in the development of our Science curriculum to ensure staff are equipped with the confidence, knowledge and skills themselves to deliver high quality lessons.

This has been in the form of training for the subject leader and members of SLT through the Wirral 1 science network run by STEM, the disseminating of this training to teaching staff in meetings, the subject leader working alongside the SLT to monitor planning, work and pupil voice and then feeding back to staff.

Impact

A variety of activities and methods are used to ensure that the planned curriculum has been taught and understood by our pupils:

At the beginning of each lesson, children are challenged to remember and retrieve key information from previous years and topics. Alongside this, at different points throughout a unit of work, the teacher may use assessment activities such as a topic quiz or mind map. This formative assessment helps teachers to identify which elements of the unit of work are well developed and which may need further reinforcement.

At the end of a unit the teacher will devise a range of assessment tasks, appropriate to the children's stage of development, to assess the pupils' knowledge, skills and understanding, for example a question and answer session, a class debate or a structured mind map. This assessment will be recorded on our science assessment grids and used to plan the next unit of work. Assessment of SEND pupils is carefully considered to allow pupils to demonstrate their levels of scientific understanding focussing on the fundamentals of the topic being taught.

To help embed knowledge, teachers plan additional opportunities to reinforce learning, eg through a whole class text (eg *Island: A Story of the Galapagos* by Jason Chin) or by making links to other curriculum areas (eg understanding of pitch and sound through the delivery of the music curriculum). Staff in all year groups have a clear understanding of the curriculum that came before which enables them to plan in meaningful opportunities for recapping where possible. In addition to this, at the start of each Science topic some time is allocated for recapping of the previous history unit (for example, in year 6 there may be a class discussion on the success criteria to make an electric circuit built on the knowledge from year 4).

The subject leader, alongside SLT will conduct other activities across the year to monitor the impact of our Science curriculum. These activities will include looking at pupils' work, spending time in lessons to get a feel for what it's like to be a pupil learning Science in the class, speaking with pupils about their scientific understanding and about how their teacher helps them to develop their skills and remember content. There will also be discussions with the teachers delivering the lesson. The aim of these activities is to build up a connected view of how well the curriculum is learned by our pupils. This information, along with the data for Science is collected in a 'Subject Impact' document which is shared with future teachers, members of the senior leadership team and parents.

This will enable us to evaluate the overall effectiveness of our Science Curriculum, making improvements as appropriate, so that pupils leave ready for the curriculum at Key Stage 3 and for life as an adult in the wider world.



KS1 and KS2 Structure of a Science Lesson at Lingham Primary School

Science Lessons are a minimum of 1hr in length and taught every week. Lessons and investigations are planned in line with National Curriculum expectations for each year group. Science assessment is undertaken through Target Tracker (steps and statements are assessed for each child).

Weekly re-cap (5-10 minutes)	<p>Every lesson starts with re-visiting previous knowledge with a focus on reviewing learning from previous lessons or units for the current year as well as knowledge from previous years.</p> <p>Recaps can take the form of varied activities (see Appendix A for examples): Retrieval point grids Tell me three Quick fire five Science bingo Science noughts and crosses Kahoot quizzes Vocabulary matching games Labelling diagrams Concept cartoons</p> <p>Select core facts to practise weekly through consulting the Science on a Page document (see Appendix B).</p>
Direct Teaching (15 - 25 minutes)	<p>Direct teaching of core knowledge and skills Children to work through core knowledge - including knowledge for working scientifically where appropriate - with the teacher on the IWB. Lessons should address common misconceptions and promote the use of relevant scientific vocabulary.</p>
Independent application / Investigation 20 - 25 minutes	<p>Children working through independent activity or group investigation. T / TA supporting as necessary. Adaptive teaching to ensure all children are able to access each objective covered.</p>

Outside the science lesson -

British Science Week	All classes from Y1-6 to dedicate a day to the teaching and exploring of concepts linked to the theme for that year. Work should be led by an investigation linked to one of the five ways of working scientifically.
Science working walls and displays	Science working walls should reflect the current topic and promote vocabulary and core learning. Whole school science displays should showcase high quality science work and investigations.
Text-based learning	Teachers will take time to plan in wider reading opportunities linked to science through shared and guided reading texts.

Presentation of books -


Children's work should be predominantly written into books with minimal sheets in KS2. Children's books should show a range of scientific diagrams e.g Carroll diagrams, Venn diagrams, classification keys, tables, line graphs, bar graphs, pictograms.

Appendix A:


Y6

Retrieval Practice Challenge

How many points can you score?




<p>1 point What is the name given to the movement of planets around the sun?</p>	<p>2 points What is friction?</p>	<p>3 points How many days does it take Earth to travel around the sun?</p>
<p>2 points Give an example of friction in action.</p>	<p>1 point Name the force that pulls objects towards Earth.</p>	<p>4 points Name the 8 main planets in the solar system.</p>
<p>4 points Why do we have day and night?</p>	<p>3 points How long does it take Earth to spin on its own axis?</p>	<p>1 point The sun a star. True or False</p>

Tell me three... 





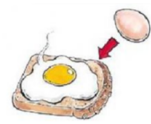
How would I separate the following?

Sand and water	Water and salt	Flour and rice

Word Bank:
Magnetism
Sieving
Filtering
Condensing
Evaporating

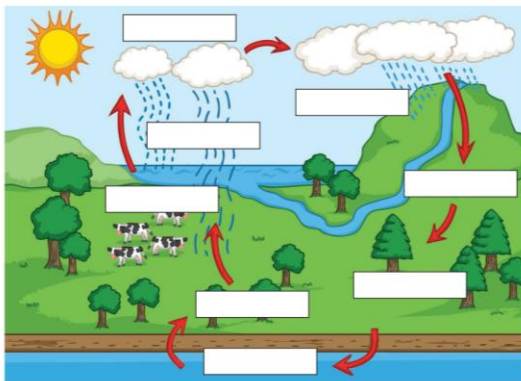
Quick-fire 5... 

Match the words to the diagrams...

Word Bank:
Solid
Liquid
Gas
Irreversible
Reversible

The Water Cycle



Add the words to the diagram:

- evaporation
- transpiration
- warm air rises
- condensation
- precipitation
- surface run-off
- infiltration
- ground water store

When you have finished, use this diagram and your key terms sheet to write a paragraph describing the water cycle.

Start like this:

Water from the sea (or a similar body) is warmed by the Sun...

The glass gets wet because the cold changes into water on the glass.

?

Maybe the ice has melted on the outside of the glass

I think the water vapour in the air has turned into drops of water on the glass.

I think that some of the water must have leaked out of the glass

What do YOU think?