SCIENCE

INTENT

Science is a systematic investigation of the physical, chemical and biological aspects of the world.

The teaching of Science at Leverhulme Community Primary School provides the foundations for understanding the world through an exciting range of biology, chemistry and physics-based topics. Pupils are taught the essential aspects of knowledge, methods, processes and uses of science. As well as this, they are taught to 'think scientifically' using the 5 strands of working scientifically: observation over time, pattern seeking, identifying and classifying; performing simple tests and research using secondary sources.

Pupils learn through 'doing' at Leverhulme and experience units that feature regular practical, hands-on opportunities to develop their knowledge and understanding of scientific concepts. Science learning is also enriched, wherever possible, by trips, visitors and themed days and weeks. Throughout school, children develop a sense of excitement and curiosity about natural phenomena linked to their practical experiences.

Through science, along with other curriculum areas such as PSHE, pupils at Leverhulme Community Primary School continue to deepen their respect, care and appreciation for the natural world and all its phenomena.

IMPLEMENTATION

PLANNING

At Leverhulme, science is planned using the statutory objectives from the National Curriculum. The individual units for each year group are sequenced in the long-term overview below.

Science	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Animals	Materials		Humans		Plants
	Seasons					
Year 2	Everyday Materials	Animals Including Humans		Animals and their Habitats		Plants
Year 3	Light	Forces and Magnets	Rocks	Animals, including Humans	Plants	
Year 4	Digestive System	Sound	States of Matter	Habitats	Electricity	
Year 5	Chemistry: Mixture & Separation (Properties and changes of materials)	Physics: Earth and Space	Chemistry: Changes (Properties and changes of materials)	Biology: Animals including humans (including reproduction in plants) Jane Goodall (text)	Physics: Forces	
Year 6	Biology Why does the heartbeat? Animals including humans	Physics What makes an electrical circuit? Electricity *Linked to DT (alarm system/ board game)*	Chemistry/Biology Why is the dodo extinct? Evolution and Inheritance	Biology How can we classify living things? Living things and their habitats	Physics How does light travel? Energy – Light and Sound	

Within the units above, staff use a range of resources, such as the school's 'knowledge, skills and vocabulary' documents for science, key knowledge organisers and further resources such as the 'Progression and Planning Document' to plan a coherent sequence of lessons.

Using the children's own questions and curiosities and to enhance theoretical understanding, staff plan a variety of practical investigations, supporting the 5 ways of 'working scientifically'. During this practical application, pupils also have the opportunity to develop knowledge, vocabulary, national curriculum strands and key questions.

Teachers plan to ensure that children are accessing this content in a way that is engaging, motivating and allows them to consolidate their knowledge and skills through different learning contexts. Working in this way also allows teachers to cover the science curriculum content through meaningful and real-life contexts.

CONTINUITY AND PROGRESSION

At Leverhulme, foundation stage pupils investigate science as part of 'Understanding the World'. Children are encouraged to investigate through practical experiences; teachers guide the children and plan opportunities that allow the children to experience and learn whilst experimenting for themselves. Children will begin to use scientific skills and gain knowledge which is then built on as the children move through Key Stage 1. These skills are then consolidated and developed during in Key Stage 2.

INVESTIGATIONS/ SCIENTIFIC ENQUIRY

In the science curriculum at Leverhulme, there is an emphasis on enquiry and investigation. It is the intent of the science curriculum that regular, suitable investigations are carried out within each unit. This can be through any of the five strands of scientific enquiry: pattern seeking; performing simple tests; secondary research; identifying and classifying and observation over time. In doing this, children cover the national curriculum 'working scientifically' objectives in depth whilst also gaining an understanding of the theory of the unit that is being covered.

At Leverhulme we have a standardised investigation framework that children are introduced to in Key Stage 1 and become increasingly familiar with throughout Key Stage 2.

LEARNING ENVIRONMENT

All classrooms have a science working wall that is surrounded by a red boarder – the same colour as the exercise books that the children use for science. These working walls should reflect the learning of the current topic and will should build up over the unit with:

- Photos/ examples of children's work
- Subject-specific vocabulary
- The five strands of working scientifically conical flasks
- Key/ big questions
- The Leverhulme science 'jigsaw piece'

ASSESSMENT

Pre- and post-assessments

Each new science unit begins with a 'pre-assessment' to ascertain the cohort's understanding of the upcoming science learning. These pre-assessments may be answering questions in a quiz (online or printed), creating a spider diagram of what they know, group or class discussion or any other creative way to assess pupil understanding. This, or a similar, assessment will then be repeated at the end of a unit to determine how much progression a child has made in their understanding of that unit of science.

Formative Assessments

At Leverhulme Community Primary School, pupils are assessed during each of their science lessons by their contributions within sessions and the work that they produce in their exercise books. These on-going assessments support staff in identifying any gaps and misconceptions within science learning – these help to inform teacher's future planning.

Summative Assessments

Assessment is an important tool used in all subjects across the curriculum. Like reading, writing and maths, pre and post assessments are used to find gaps before children start a unit of work and to look at how much they know at the end of the unit. From this, any gaps are identified and these would be plugged through starter activities, during teaching, in additional sessions or when a subject is closely linked somewhere else in the curriculum.

Foundation subjects are assessed through post-assessments throughout the year (see details of how this is specifically done in Science below) and a final teacher assessment/judgement at the end of Summer 2, where the subject is assessed as a whole using information collated throughout the year to make an overall judgement. This is done for every non-core assessment. Children are recorded as 'JA' or 'At' for their year group.

- **JA** – demonstrating that they have been taught the curriculum and have demonstrated some of the features of this year group's expectations, including some, skills, knowledge and vocabulary.
- **At** - demonstrating most (or indeed all) of the features of this year group's expectations for the subject, including, skills, knowledge and vocabulary.

The assessment for non-core is recorded on Sonar, following the steps below.

- Log into Sonar
- Select 'assessments'
- Select 'primary summative'
- Select Year Group and Class
- Change 'core subjects' to 'foundation subjects'
- Select subject and choose JA (Just At) Or At (Securely At)

Furthermore, an analysis form is completed for non-core subjects (see Teaching and Learning Handbook). Staff complete the % of children working at '**JA**' and at '**At**', as well as, notes on strengths and next steps. This information can be related to individuals, groups of pupils or whole class themes. The analysis form is passed up to the next teacher to inform future planning and to build on prior knowledge.

The attainment of Year 6 students in science is reported to the STA via the PAG in June of each academic year in line with the statutory requirements for Key Stage 2 teacher assessment.

Pupils in the Early Years Foundation Stage will have their attainment measured against the 'Early Learning Goals, as part of their EYFS profile.

Reporting to Parents

Progress and attainment is reported to parents through parents' evenings and end of year reports.

HEALTH AND SAFETY

Pupils are taught to use scientific equipment safely when using it during practical activities. All equipment is checked before it is used in lessons and any damaged or broken equipment is reported and disposed of. For any experiments that involve resources not usually used within the classroom (for example, a kettle), teachers will carry out a simple risk assessment and report to SLT to ensure the experiment can occur safely.

IMPACT

Our science curriculum is well-thought-through and planned in a robust yet flexible way so that children's interests, curiosities and questions can be integrated into the scientific knowledge and conceptional understanding of biology, chemistry and physics that they need during their primary school journey. We recognise the importance of high-quality science education in preparing students for a future where being scientifically equipped and having problem-solving skills are vital.

This policy reflects our commitment to delivering a science curriculum that meets the needs of the diverse learners in our school.

We measure the impact of this curriculum through:

- Regular scrutinies of children's work books – this includes examples of pre and post assessment tasks that have been conducted.

- Science learning walks – looking at environments, science working walls and observing the teaching and learning of the subject across the school.

- Pupil & staff voice – discussing the pupils' learning journeys within science and listening to the views, thoughts and feelings of the school community on the science curriculum at Leverhulme.