

Lucas Vale Primary School

Science Policy

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Intent

At Lucas Vale, we teach science so that it enables children to explore and discover the world around. We plan and deliver lessons which 'first develop and then maintain curiosity' in our pupils. Without curiosity and wonder children lose their natural inclination to observe the world, ask questions of it and investigate to find answers. We make sure that science at Lucas Vale is child led and enquiry based.

Our vision is to deliver a science curriculum which is both safe and stimulating. Through science children are able to; explore and discover the world around, ask and answer questions and develop a range of scientific skills throughout each curriculum area. They will encounter challenging and creative learning experiences, both inside and outside of school, which will move them forward with confidence and self-belief. Through deepening their understanding of the world around them, children will become independent and resilient learners. Specialist vocabulary for each unit is taught and built up, and effective questioning to communicate ideas is encouraged throughout every year group.

Implementation

Curriculum

Within the national curriculum units, science tasks will have three types of learning goals: knowledge, skills and understanding. Knowledge is about facts. In order to assess children's' knowledge, regular assessment whether written or oral should be done. Teachers need to ensure that discussion and debate are a central theme in science lessons so that pupils share and debate science knowledge. Teachers should also ensure that questioning is a central part to science lessons, this will guarantee that children are understanding what is being taught, misconceptions are addressed, children are constantly moving on with their learning and children maintain curiosity.

Skills are practical and experiential. They are not right or wrong but developmental and so children build their scientific skills overtime. Scientific skills should be developed in the pursuit of 'finding out' so that children learn to apply their skills in order to investigate science questions. Through the different types of investigation children should find answers to their science questions. It is important that children begin to understand the five types of investigation and which types of question each type will answer.

Types of investigation children should develop:

Type of investigation	Examples of investigation questions
Identifying and classifying- making observations to name, sort and organize items	<ul style="list-style-type: none">• What do different animals eat?• All the food in the shop has been muddled up- how can we sort it?• What type of shoes do most children have?• How can we sort the cloths in the play corner?
Observation over time- observing changes that occur over a period of time ranging from minutes to months	<ul style="list-style-type: none">• What happens to a seed when it grows?• What happens to bread if it's left out for a long time?• What happens to the ice cube in your hand?• What happens to the sun over the course of a day?
Pattern seeking- identifying patterns and looking for relationship in enquiries where variables are difficult to control	<ul style="list-style-type: none">• Do birds feed at different times of the day?• Which flower do mini beasts prefer?• Do all oranges have the same number of seeds?• Do we all have the same size feet?
Comparative/ Fair testing-	<ul style="list-style-type: none">• What happens to a seed when it grows?

Changing one variable to see its effect on another, whilst keeping all the others the same	<ul style="list-style-type: none"> • What happens to bread if its left out for a long time? • What happens to the ice cube in your hand? • What happens to the sun over the course of a day?
Research- using secondary sources of information to answer scientific questions	<ul style="list-style-type: none"> • How does a dentist help us look after our teeth? • What is the most common mini beast in the UK? • How are candles made? • How is plastic made?
Problem solving- Applying prior scientific knowledge to find answers to problems	<ul style="list-style-type: none"> •

Equal Opportunities and Inclusion

The pupils work individually, in pairs, or as part of a small group and as a whole class each term. All children should be stretched and challenged through the depth of investigation and questioning; some children will need more support than others. Differentiation should always be considered (mainly through intervening with questions to scaffold and support learning) and this should include the action of support staff in the class. It should be remembered that while some children might need support at times, there are also times when teaching staff need to stand back and allow for discovery. All children have equal access to the full Science programme of study that satisfies the National Curriculum 2014 requirements.

Health and Safety:

All staff should make themselves up-to-date with the following; - In regard to science work in school all teachers will be familiar with the 'Be Safe' safety booklet. Where appropriate reminders will be given to children about potential hazards and care of the equipment they are using.

Any trips should have been planned with due regard to the school policy on taking children on outings. LEA guidance may need to be sought on trips involving farms etc.

It is the class teacher's responsibility to ensure science activities are safe.

Science Procedures

How we teach Science:

- ❖ Science is taught using the National Curriculum as a foundation: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425618/PRIMARY_national_curriculum_-_Science.pdf
- ❖ To ensure there is consistency and progression in the knowledge, skills and understanding of science, teachers may also use the 'Science Bug' scheme of work
- ❖ Lessons are already planned on the scheme; teachers should adapt and add necessary questioning to ensure minimal misconceptions and learning is constantly moving on
- ❖ Every unit starts with a knowledge capture activity to (informally) assess what knowledge and idea/concepts children have at the beginning of the unit (this will also help to identify children who have missed previous science learning e.g. Light in year 3 is taught again in year 6, children should have a basic understanding of light, if they do not then after the first lesson teachers are to set a small intervention group to close the gaps in the missed knowledge)

- ❖ Throughout the teaching cycle there are regular opportunities for children to reflect on their learning allowing for formative assessment throughout.
- ❖ We use real-life examples, practical and simulation activities
- ❖ Children use knowledge and skills to carry out an investigation or to apply to a situation (Investigations encourage children to pull together their knowledge and skills to test out ideas and get evidence for any conclusions they come to)
- ❖ The activities at the end of each unit allow children to demonstrate their understanding of the knowledge and skills they have been taught and explain whether their initial ideas have changed or not and why.
- ❖ Summative assessments should also be conducted at the end of each unit. These are a mixture of written and practical activities
- ❖ Key scientific vocabulary must be displayed and explicitly classroom needs to have a Science display that reflects the Unit you are covering. Examples of children's learning should also be displayed throughout the topic (copied from books or through photographs).

Resources:

- ❖ Science resources are kept in the science resource cupboard, which is located on the first floor next to the staff room.
- ❖ Each year group has an allocated box for each topic. Each box has the key vocabulary specific to the topic and also those specific to Working Scientifically (these are the vocabulary that should be displayed).
- ❖ Resources within each box are suggestions for what should be used according to Science Bug. If teachers use anything else that had an impact on children's learning then it would be appreciated if they leave it in the box with a note briefly explaining 'how to use' for the next (year) group
- ❖ Please return resources neatly when you've finished with them and let the science subject leader know, via email, if any resources need to be replenished
- ❖ If you have any requests for resources, or any resources run out/break during their use please let the science subject leader or Resources Manager know immediately, via email.
- ❖ Each teacher will have a Science Bug Login so that they are able to access the planning to prepare lessons
- ❖ Science should be recorded in the red science books
- ❖ Teachers to ensure that target posters for each unit is stuck in children's book at the start of each unit (this is also used as an assessment tool).
- ❖ At the end of each unit children should be encouraged to self-assess against each objective on the target poster.

Planning:

Medium term planning-

- ❖ Please refer to the Science Bug Planning via Activelearn <https://www.activelearnprimary.co.uk/login?c=0> for an overview of each topic
- ❖ List of resources needed for the unit

Weekly planning –

- ❖ The class teacher is responsible for tailoring the medium-term plans for their class.
- ❖ The Science Bug planning lists the specific learning objectives (turn these into learning questions) (both Working Scientifically and Knowledge objectives from the curriculum)
- ❖ Differentiation should be clear
- ❖ Teachers should work with their partner teacher, to ensure there is consistency and coverage for all children.

Marking and feedback:

Feedback during science lesson should redirect and refocus the teachers or the learner's actions to achieve the learning goals. Science feedback can be verbal or written. It can come from a teacher or someone taking a teaching role, or from peers. Learning should be marked during the lesson time to provide instant feedback, clear misconceptions and move children's learning on. Teachers are expected to 'deep mark' science once per unit and ensure:

- ❖ Children are using vocabulary specific to the unit
- ❖ Vocabulary is used correctly
- ❖ A learning question is used to move learning on or to clear a misconception
- ❖ Children who are not making progress are given extra support to close any gaps
- ❖ Children who have achieved the learning objectives are challenged to apply or deepen their skills, knowledge and understanding.

Written marking should pick up on spelling, grammatical and punctuation errors.

Assessing in Science:

Assessment is ongoing in science. Teachers plan ahead and choose which knowledge and skill children will learn. Using this teachers will state if children are expected of still working towards the knowledge and skill. At the end of each term, KS2 children will take part in a formal written test, through Pixl, which teachers will then mark and use as a gap analysis resource to ensure the areas for development are addressed in the next science unit.

Cross-curricular skills and links:

Science pervades every aspect of our lives and we will relate it to all areas of the curriculum. We will also ensure that pupils realise the positive contribution of both men and women to science and the contribution from those of other cultures. We will not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce.

English – opportunities to write for varied purposes, with the characteristics of different kinds of writing. For example, chronological reports, recounts, and note taking

Mathematics – developing skills in data handling, measurements and mathematical relationships

Art – understanding of materials and their properties

Geography – exploring physical processes

History – researching Scientists and their discoveries

IT – data handling and research

PSHE – health and safety education

SMSC- developing our awe and wonder of the world, impact of science, working collaboratively, explore and celebrate research and developments both past and present

Key skills

Foundation Stage	Play underpins the delivery of all the EYFS. In playing, children behave in different ways: sometimes within their play, they may describe and discuss what they are doing and sometimes they may be more reflective and quiet as they play. Within a secure and challenging environment with effective support, children can explore, develop and experiment as they play to help them make sense of the world. The EYFS strand ‘Understanding the World’ leads directly to scientific elements of the curriculum and leads to more formalised Science learning in KS1 and then KS2.
Year 1	<ul style="list-style-type: none"> • Ask simple questions and understand they could be answered in different ways. • Observe closely, using simple equipment (like magnifying glasses.) • Perform simple tests (to find things out) • Identify and classify (sort) living and non-living things. • Use my observations and ideas to suggest answers to questions. • Gather and record data (information) to help in answering questions.
Year 2	
Year 3	<ul style="list-style-type: none"> • Ask relevant questions and using different types of scientific enquiries to answer them. • Set up simple practical enquiries, comparative and fair tests. • Make organised and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, key bar charts, and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Identify differences, similarities or changes related to simple to simple scientific ideas and processes.
Year 4	

	<ul style="list-style-type: none"> • Use simple scientific evidence to answer questions or to support their findings.
Year 5	<ul style="list-style-type: none"> • Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurement, using a range of scientific equipment, with increasing accuracy, taking repeat readings when appropriate. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Use test results to make predictions to set up further comparative and fair tests. • Report and present findings from inquiries in oral and written forms such as displays and other presentations. This includes drawings conclusions and explaining and explaining how things happen and how far I trust the results found. • Identify scientific evidence that has been used to support or refute ideas or arguments.
Year 6	

Impact

Lucas Vale's Science Curriculum measures the impact by ensuring that the high quality and progressive lessons are showing that children are acquiring the appropriate age related knowledge linked to the science curriculum.

By the end of each topic and each academic year, children will have a deeper and more precise set of scientific skills, which they will be able to use in the following academic year, a richer vocabulary, which will enable them to confidently articulate their scientific understanding of the world around them and lastly teachers high aspirations, which will enable them to confidently access the next stage in science and learn successfully.