Lowca Community School
Science Policy
Updated: June 2021
Due for Review: September 2022

The Purpose of study for Science at Lowca Community School.

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us.

Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability.

Aims:

Our aims in teaching science include the following:

1. Preparing our children for life in an increasingly scientific and technological world.

2. Fostering concern about, and active care for, our environment.

3. Encourage every child to investigate, question and discuss in order to acquire scientific knowledge, understanding and skills.

4. Encourage children to hypothesise and to find ways of testing their ideas to provide evidence to support their ideas.

5. Teach scientific vocabulary and to use a variety of ways to present the results of their investigations.

6. Promote key skills by offering a range of contexts for the development of:

●Literacy – communicating facts, ideas and opinions.

●Mathematics – application of number through collecting, considering and analysing data.

●ICT – through using a wide range of ICT Provide opportunities to learn about aspects of personal, social and health education (PHSCE) and citizenship.

8. Ensure children recognise hazards and risks when working with living things and materials and agree safety rules.

9. Provide opportunities that engage the children in relevant, interactive first-hand experiences.

10. Encourage children to work co-operatively and collaboratively, developing children's confidence in communicating ideas.

11. To provide opportunities for all children regardless of race, gender, class, aptitude or disability.

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Our Objectives:

We will fulfil these aims by:

1. Using the rich and stimulating environments that surround our schools to enable us to provide opportunities for learning about life processes and living things, through observation, questioning and wonder.

2. Providing a wide range of interactive, practical activities for individual and group work that encourage the children to explore and find out and develop their understanding of key scientific ideas and make links between different experiences.

3. Developing the children's investigative skills and understanding of Science through the use of questioning and giving them opportunity to express their findings and ideas to their peers and a wider audience.

4. Planning opportunities to develop skills such as: predicting, asking questions, making inferences, drawing conclusions and making evaluations based on evidence and understanding.

5. Teaching scientific and mathematical language, including technical vocabulary and conventions, and drawing diagrams and charts to communicate scientific ideas.

6. Planning opportunities to extract information from sources such as reference books, magazines, video clips or DVD's and ICT as well as through science visits and visitors to school.

7. Working collaboratively in pairs or groups, listening to and sharing ideas and treating these with respect.

8. Taking part in the annual National Science Week activities.

Attitudes

1. Encouraging the development of positive attitudes to science.

2. Building on our children's natural curiosity and developing a scientific approach to problems.

3. Encouraging open-mindedness, self-assessment, perseverance and responsibility.

4. Building our children's self-confidence to enable them to work independently.

5. Developing our children's social skills to work cooperatively with others.

6. Providing our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills

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1. Giving our children an understanding of scientific processes.

2. Helping our children to acquire practical scientific skills.

3. Developing the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.

4. Developing the use of scientific language, recording and techniques.

5. Developing the use of ICT in investigating and recording.

6. Enabling our children to become effective communicators of scientific ideas, facts and data.

Curriculum – What you will see in our school.

In KS1 and KS2, teachers have access to a range of resources to help support their planning and delivery of science. All teachers have signed up to the websites Explorify and STEM.org.uk. Teachers are aware of and able to use TES, BBC Teach and Bitesize, Twinkl and BPscience, Twig Science Reporter and the World News for stimuli. All of these resources are adapted to suit the needs of each class and individual children. They should not be used in isolation, as they would not enable sufficient enrichment.

Science is usually taught alongside the termly topic, taking advantage of links that give context (see Appendix 1). Lessons are weekly and links to English and Maths are encouraged. Science can also be taught discretely if an enquiry is raised within the class that follows the children's interests and questions or seasonal work needs to be covered. Teacher's medium-term planning at the start of each topic also includes children's questions and ideas for learning that are compiled at the start of each term (see Appendix 2).

In EYFS, Science is also taught through the half termly topic through the Early learning Goal of Understanding of the World. We actively encourage our EYFS pupils to engage in the world around them and make use of our outdoor spaces to allow children to observe changes as the year progresses. Lowca Community School has acknowledged, as a result of recent training, that there must also be opportunities for some discrete science learning for pupils in EYFS.

Teaching and Learning Strategies

As in other areas of the curriculum, Science is taught in accordance with our Teaching and Learning Policy. Each child is taught at his or her own level through a planned progression of learning activities to enable them to achieve their full potential. We use a variety of teaching and learning styles in science lessons.

Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes we do this through whole class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. They

have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs; use ICT in science lessons because it enhances their learning; take part in role-play and discussions and engage in a wide variety of problem-solving activities.

Wherever possible, we involve the pupils in real scientific activities and STEAM days (either teacher-led or from STEM ambassadors' visits), for example, investigating a local environmental problem, or carrying out a practical experiment and analysing the results.

We recognise that in all classes, children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

• Setting tasks which are open-ended and can have a variety of responses;

• Setting tasks of increasing difficulty (we do not expect all children to complete all tasks);

• Allow opportunities for children to identify their own questions to investigate.

• Allow opportunities for children to decide how they wish to record their own observations and outcomes.

• Working with individual children;

• Enabling children to work collaboratively;

• Providing resources of different complexity, matched to the ability of the child;

• Using classroom assistants to support the work of individual children or groups of children.

Recording Science Effectively

Recording science is key to enabling pupils to evaluate their progress and express their opinions and observations. All children throughout school are issued with a science recording book. This contains an individual Working Scientifically Self-Assessment sheet, which pupils are able to complete as they work through each Key Stage. Lessons have clear learning objectives and success criteria that the children or adults can tick off as the learning is achieved.

Exercise books are available to be viewed during the year and also before the start of each year by teachers, the Head and Science lead, especially if the child is moving up a class. Children take their completed books home annually.

In EYFS and where necessary in key stages 1 and 2, specific scientific work may be recorded in the form of a floor book, rather than individually if preferred. The self-assessment sheets are still completed after discussions for each child.

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Equal opportunities in science

• We ensure that all our children have the opportunity to gain science knowledge and understanding regardless of gender, race, class, physical or intellectual ability.

• We will actively promote strong female and ethnic minority scientific role models.

• Our expectations do not limit pupil achievement and assessment does not involve cultural, social, linguistic or gender bias.

• We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people from a variety of backgrounds.

• We draw examples from other cultures, recognising that simple technology may be superior to complex solutions.

• We value science as a vehicle for the development of language skills, and we encourage our children to talk constructively about their science experiences.

• In our teaching, science is closely linked with English and mathematics.

• We recognise the particular importance of first-hand experience for motivating children with learning difficulties.

• We recognise that science may strongly engage our gifted and talented children, and we aim to challenge and extend them.

• We exploit science's special contribution to children's developing creativity; we develop this by asking and encouraging challenging questions and encouraging original thinking.

Assessment

In EYFS, assessment is through observation and is mainly formative. The Foundation Stage Guidelines offer examples of children behaviours' help identify when knowledge, skills, understanding and attitudes have been achieved by individuals or groups of children. This informs planning for the next stage in the children's learning.

Children's progress in science is monitored throughout the year. Parents are informed of children's progress through parent consultation evenings and an end of year report. Teachers help children to develop skills and confidence by looking at their work and discussing it with others in order that they can identify success, strength and weaknesses and plan next steps in their learning. Appendix 3 shows the succession of science skills from EYFS to Year 6 so teachers can take into account prior learning and can at a glance see where the children are progressing to through the whole of the school.

Observations during practical work and discussions help us to make informed judgements about children's understanding in science. In line with the National Curriculum, assessment throughout Key Stage 1 and 2 is based on teacher's assessments of the children's progress in the different areas of

study. Written assessment question booklets are available on Twinkl and quizzes can also be used to help the teacher gather data.

Health and Safety

Health and safety is an integral part of teaching. As teachers and citizens in a dangerous world, we have a responsibility to encourage children to approach hazards in a safe way. There are few risks associated with primary science but children should be taught the importance of safety and the correct way of handling tools, materials and equipment. Teachers will use their professional judgments as to the suitability of any experiment for their class, bearing in mind their age and maturity. Teachers will always supervise all activities and it will sometimes be appropriate to have the support of other adults. If there is an accident the teacher will alert the school first-aiders and the Head Teacher. Accidents will be recorded in the school's accident book.

When considering safety procedures, guidance can be sought from the science lead or the Head Teacher. For further information staff should refer to the "Be Safe" booklet which is produced by the Association for Science Education, a copy of which can be found in the resources area. All electrical appliances in school are PAT tested. All staff should visually check electrical equipment before they use it and take any damaged equipment out of use. Where children are to participate in activities outside the classroom (a trip to a science museum, or the beach, for example) we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Resources

Science resources are managed by the science subject lead and they are responsible for ordering new or replacement equipment, in consultation with the staff and the Head Teacher. The subject leader is also responsible for checking all resources annually.

We have sufficient resources to support science teaching in our school. They are stored within classrooms, the Eco-House, the Hall cupboard and the Junior Conservatory.

The central library area and class reading corners contain a good supply of science topic books to support children's individual research which is enhanced by the use of computers. Topic packs can also be ordered from the termly School’s Library Service via the school office. Cl;ass 4 have a subscription to The Week Junior to give them access to current science developments.

All children should be encouraged to develop necessary skills in order to handle the equipment in the appropriate scientific way. These skills should be progressively built upon as the children move through the key stages.

All children should be made aware of safety factors

The Role of Parents

Parental involvement is one of the targets for the Science Lead's action plan. Aiming to improve active Parental involvement with STEAM activities by introducing Science shows and fairs run by the children at Lowca once the Covid social distancing rules allow. When it is appropriate Teachers may also choose tasks to be sent home for the child and parent to work on together, thereby involving the parent in the child's learning. Opportunities for parental involvement can be built into the science planning and may include:

• the making of lists

• collecting material or information

• undertaking small surveys

• questioning adults in the house

• making observations of the environment around the house or local area.

During both Lockdown's Parents across the whole school were actively involved in a range of science activities with their children. From taking part in daily nature walks and surveys, to collecting materials and joining in with online chemistry sessions.

Future Scientists and Careers in Science

The North West of England is a hive of science industry and training. As a school, Lowca Community School will seek to develop opportunities to link with local industries such as Sellafield, Jacobs, Nuvia, The National Trust, Lego etc and training centres including Inspira, Gen2, Lakes College, Energy Coast UTC, etc to show potential career opportunities.

Lowca Community School will strive to show how science links to our real-life, everyday situations, and through inspirational teaching, intended to develop aspirations and inspire our pupils.

This policy will be reviewed in September 2022.