Cledford Primary School and Gainsborough Primary & Nursery School

A Federation of Cheshire East Primary Schools

Cledford Primary School

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Local Authority Code: 895
Establishment Number: 3821

School Principal: Mr C Adlington

Gainsborough Primary & Nursery School

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Local Authority Code: 895
Establishment Number: 3810

School Principal: Mrs J Nurse

Federation Headteacher: Mrs A J Booth

Federation Curriculum Policy - Science

Reviewed: October 2022

Signed:

Mrs J Sercombe (Chair of Governing Board) …….

Mrs AJ Booth (Federation Headteacher) …….

Mrs J Nurse (School Principal GPNS) …….

Mr C Adlington (School Principal CPS) …….

Next Review Date: October 2024

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Intent

At the Cheshire Federation, we aim to deliver a high quality science education which enables learners to:

- develop scientific knowledge and conceptual understanding
- develop an understanding of nature, processes and methods of science through different types of scientific enquiries that help them to answer scientific questions about the world around them
- be equipped with the scientific skills required to understand the uses and implications of science today and in the future

We want children to be inspired and encouraged to be inquisitive about the world. We want to provide them with skills that are useful across their learning and life. Science is for everyone. Giving them an understanding of science allows children to make judgements about technologies, health and other important factors of the world.

We want all children to have a positive experience of science giving it clear purpose and meaning in the world today, so that it excites and engages all learners and teachers.

Developing the children's vocabulary is paramount. As science is a discipline that relies heavily on the ability to understand new terms and concepts, our strong focus on vocabulary helps our students to reduce the barriers they have to learning and communicate using the appropriate terminology.

Implementation

Our curriculum is designed to ignite the imagination of our pupils. Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of the National Curriculum programmes of study for Science 2014 and 'Understanding of the World' in the Early Years Foundation Stage.

Science teaching involves adapting and extending the curriculum to match all pupils' needs and making it bespoke for our pupils and the community.

Science at Cledford Primary School and Gainsborough Primary & Nursery School is sequential, allowing children to develop their skills and knowledge over time, deepening learning to provide the foundations so they know more, remember more and are able to do more in different contexts.

Teachers create yearly long-term plans with the support of subject leaders, identifying the curriculum end points. Medium term plans are developed collaboratively with subject leaders and class teachers. Lessons are sequential and use a variety of scientific enquiries throughout each topic. In giving the children a variety of skills, our children can develop and reach their individual potential and succeed in life. These different scientific enquiry skills (observing over time, pattern seeking, research, comparative and fair testing and identifying, classifying and grouping) are embedded into lessons throughout each topic. These scientific enquiry skills are displayed in the classroom on science working walls and identified each lesson.

<u>Scientific Enquiry Expectations:</u>

- KS1 – with the support of the teacher, the children will be able to identify the scientific enquiry they have used
- LKS2 – As the children are carrying out a specific type of scientific enquiry, they will be able to identify which one they are using
- UKS2 – Children will be able to identify which type of scientific enquiry would be appropriate to use

This is done so that the children will become more independent in their problem solving, to discover answers to their questions and to become 'true scientists'.

Each science unit begins with a pre-assessment task, where children develop (or are given in KS1) a bank of vocabulary to support their learning. At the end of each unit, children are assessed through a variety of processes: talk like an expert, low stakes quizzes and formal assessment where appropriate. Each lesson includes a recap of prior 'sticky' knowledge (this could be from a previous lesson in the sequence or a prior learning from previous year groups where necessary) to support children in knowing more and remembering more. Scientific 'sticky' knowledge is stuck into the children's books at the beginning of a topic and uses as a focus for assessment.

Impact

The successful approach to the teaching of science at Cledford Primary School and Gainsborough Primary & Nursery School will result in a fun, engaging, high quality science education, that provides children with the foundations for understanding the world that they can take with them once they complete their primary education.

Assessment is teacher based and formed using formal strategies (e.g. end of topic assessment tasks, quizzes) and informal strategies (verbal/written outcomes, talk like an expert).

Formative assessment is used as the main tool for assessing the impact of science at Cledford Primary School and Gainsborough Primary & Nursery School as it allows teachers to identify misconceptions and the gaps to be addressed more immediately rather than building on insecure scientific foundations.

Our science curriculum ensures that all children are provided with rich learning experiences that will:

- Prepare children for life in an increasingly scientific and technological world today and in the future
- Develop children's use of scientific language
- Help children to make cross curricular links between science and other subjects
- Help children acquire a growing understanding of the nature, processes and methods of scientific ideas
- Help develop and extend children's scientific concept of their world
- Build on children's natural curiosity and developing a scientific approach to problems
- Provide the opportunity for children to ask scientific questions and answer them

Our curriculum plans in science are clear on what end points the pupils are working towards and what pupils will need to be able to know and do at those end points.

The science curriculum is planned and sequenced so that new knowledge and skills build on what has been taught before, and towards defined end points.

The science curriculum reflects the school's local context by addressing typical gaps in pupils' knowledge, skills and experiences.

The science curriculum is broad and creatively linked to other subjects, with an emphasis on English skills (quality texts where appropriate) and mathematical skills.

Disadvantaged pupils or pupils with SEND are supported to access the same broad and challenging curriculum as all other pupils through targeted support or differentiation where appropriate.

Teachers have expert knowledge of science and, where they do not, they are supported to address any gaps so that pupils are not disadvantaged.

Teachers enable pupils to understand and embed in long term memory, key concepts in science, presenting information clearly and promoting appropriate discussion. Teachers check pupils' understanding effectively, identifying and correcting misunderstandings.

Teachers use assessment effectively to check pupils' understanding in order to inform their teaching and further planning; this helps pupils to embed and connect knowledge fluently and to further develop their learning and skills.

1. Legal Framework

1.1.1.1. This policy has due regard to all relevant legislation and statutory guidance including, but not limited to, the following:

- DfE (2013) 'National curriculum in England: science programmes of study'
- DfE (2017) 'Statutory framework for the early years foundation stage'

2. Roles and Responsibilities

2.1. The **science subject leader** is responsible for:

- Preparing policy documents, curriculum plans and schemes of work for the subject.
- Reviewing changes to the national curriculum and advising on their implementation.
- Monitoring the learning and teaching of science, providing support for staff where necessary.
- Ensuring the continuity and progression from year group to year group.
- Encouraging staff to provide effective learning opportunities for pupils.
- Helping to develop colleagues' expertise in the subject.
- Organising the deployment of resources and carrying out an annual audit of all science resources.
- Liaising with teachers across all phases.
- Communicating developments in the subject to all teaching staff.
- Leading staff meetings and providing staff members with the appropriate training.
- Organising, providing and monitoring CPD opportunities in the subject.
- Ensuring common standards are met for recording and assessment.
- Advising on the contribution of science to other curriculum areas, including cross-curricular and extra-curricular activities.
- Collating assessment data and setting new priorities for the development of science in subsequent years.

2.2. Classroom teachers are responsible for:

- Acting in accordance with this policy.
- Ensuring progression of pupils' scientific skills, with due regard to the national curriculum.
- Planning lessons effectively, ensuring a range of teaching methods are used to cover the content of the national curriculum.
- Liaising with the **science subject leader** about key topics, resources and supporting individual pupils.
- Monitoring the progress of pupils in their class and reporting this on an **termly** basis.
- Reporting any concerns regarding the teaching of the subject to the **science subject leader** or a member of the **SLT**.

- Undertaking any training that is necessary in order to effectively teach the subject.

3. Early Years Provision

3.1. Activities and experiences for pupils will be based on the seven areas of learning and development, as outlined in the DfE's 'Statutory framework for the early years foundation stage'.

3.2. Provision for early years pupils focusses on four specific areas:

- Literacy
- Maths
- Understanding the world
- Expressive arts and design

3.3. All activities will adhere to the objectives set out in the framework.

3.4. In particular, science-based activities will be used to develop pupils' understanding of the world, helping them to comprehend a world beyond their local community.

4. The National Curriculum Programmes of Study

4.1.1. The national curriculum is followed and provides a full breakdown of the statutory content to be taught within each year group and each topic.

5. Working scientifically

5.1 During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

5.2 During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

5.3 During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

6. Cross-curricular links

6.1. Wherever possible, the science curriculum will provide opportunities to establish links with other curriculum areas.

6.2. English

- Quality texts are used as a stimulus to ignite pupils' curiosity where possible
- Pupils are encouraged to use their speaking and listening skills to describe what is happening.
- Pupils' writing skills are developed through recording findings and creating reports.
- Pupils' vocabulary is developed through the use and understanding of specialist terminology.

6.3. Maths

- Pupils use their knowledge and understanding of measurement and data handling.
- Where appropriate, pupils record findings using charts, tables and graphs.
- Pupils use data analysis in order to identify patterns.

6.4. Computing

- ICT will be used to enhance pupils' learning.
- Pupils will use ICT to locate and research information.
- ICT will be used to record findings, using text, data and tables.

6.5 Personal, social and health education (PSHE) and citizenship

- Science can make a significant contribution to the teaching of personal, social and health education.
- Children can consider and debate how society's attitude global environment.
- Science can encourage positive citizenship.

7. Teaching and Learning (Pedagogy)

7.1. Pupils will be taught to describe key characteristics and associated processes in common language, as well as understand and use scientific vocabulary.

7.2. Pupils will undertake independent work, and have the opportunity to work in groups and discuss work with their peers.

7.3. Lessons will allow for a wide range of scientific, enquiry-based research activities, including the following:

- Pattern seeking
- Comparative and fair testing
- Identifying, classifying and grouping
- Researching using secondary sources
- Observing over time

They will do this through:

- Practical experiences
- Collaborative work
- Role-play and discussions
- Problem-solving activities

7.4. The classroom teacher, in collaboration with the **science subject leader**, will ensure that the needs of all pupils are met by:

- Providing resources of differing complexity according to the ability of pupils.
- Setting tasks of varying difficulty depending on the ability group.
- Utilising teaching assistants to ensure that pupils are effectively supported.

7.5. Opportunities for outdoor learning and practical work will be provided wherever possible.

7.6. Each year group will be encouraged to undertake an external educational visit, which is science based.

7.7. Feedback

Feedback should:

- Redirect and focus either the teachers' or the learners' actions to achieve a goal
- Be specific, accurate and clear
- Encourage and support further effort
- Inform future planning, ensuring continuity, progression and appropriate differentiation
- Be given sparingly so that it is meaningful
- Put the onus on students to correct their own mistakes, rather than providing correct answers for them
- Alert the teacher to misconceptions, so that the teacher can address these in subsequent lessons
- Encourage children to take responsibility for improving their own learning by self assessment and peer assessment
- Ultimately be seen by pupils as a positive approach to improving their learning

8. Planning

8.1. All relevant staff members are briefed on the school's planning procedures as part of staff training.

8.2. Throughout the school, science is taught as a discrete lesson and as part of cross-curricular themes when appropriate.

8.3. Lesson plans will demonstrate a balance of interactive elements used in teaching, ensuring that all pupils engage with their learning.

8.4. Long-term planning overviews are used to outline the units to be taught within each year group.

8.5. Medium-term plans are used to outline the vocabulary and skills that will be taught in each unit of work, as well as highlighting the opportunities for assessment.

8.6. Medium-term plans will identify learning objectives, main learning activities and differentiation.

8.7. Medium-term plans will be shared with the **science subject leader** to ensure there is progression between years.

8.8. All lessons will have clear learning objectives, which are shared and reviewed with pupils.

9. Assessment and Reporting

9.1. Pupils will be assessed, and their progression recorded, in line with the school's **Assessment Policy**.

9.2. Throughout the year, teachers will plan ongoing assessment opportunities in order to gauge whether pupils have achieved the key learning objectives.

9.3. Assessment will be undertaken in various forms, including the following:

- Talking to pupils and asking questions
- Recap of prior learning and 'sticky' knowledge

- Discussing pupils' work with them
- Observing practical tasks and activities
- Pupils' self-evaluation of their work
- Classroom tests/quizzes

9.4. Formative assessment, which is carried out informally throughout the year, enables teachers to identify pupils' understanding of subjects and informs their immediate lesson planning.

9.5. In terms of summative assessments, the results of end-of-year teacher assessments will be passed to relevant members of staff, such as the pupil's future teacher, in order to demonstrate where learners are at a given point in time.

9.6. Parents will be provided with a written report about their child's progress during the Spring term every year. These will include information on the pupil's attainment, progress and attitude towards science.

9.7. Verbal reports will be provided at parent-teacher interviews during the Autumn and Summer terms.

9.8. Pupils with SEND will be monitored by the SENCO, and the appropriate support will be put in place.

10. Resources

10.1 There is a range of resources to support the teaching of science across the school including a range of practical equipment, in addition to a wide range of texts.

10.2 Teachers have access to the library service and can order a wide range of books and resources for each area of learning.

10.3 Children have access to the internet through computers, laptops, iPads and interactive whiteboards.

11. Equal Opportunities & Inclusion

11.1 We are committed to giving all of our children every opportunity to achieve excellence. We do this by taking account of pupils' varied life experiences and needs.

11.2 Our curriculum is broad and balanced and we have high expectations of all children.

11.3 The achievements, attitudes and well-being of all our children matter, regardless of ethnicity, attainment, age, disability, gender or background.

11.4 We actively seek to remove barriers to learning and participation that have the potential to hinder or exclude individuals or groups of children.

11.5 Equality of opportunity must be a reality for our children and we ensure this through the attention we pay to the different groups of children within our school.

12. Staff Development

12.1 Teachers are expected to have good, up to date subject knowledge and to use the materials that are available to them in order to promote the best outcomes for children.

12.2 Training needs are identified as part of our whole school monitoring and evaluation, performance management/appraisal and induction programmes. These needs are reflected in the School Development Plan.

12.3 Ongoing coaching is given, where needed, throughout the year by subject leaders and SLT.

12.4 Staff have the opportunity to observe their colleagues teach as part of an informal coaching programme.

12.5 Subject leaders arrange for relevant advice, resources and information, for example feedback from training, to be disseminated appropriately with colleagues.

12.6 Where necessary, in conjunction with the SLT and in order to secure outstanding subject knowledge, subject leaders lead or organise training for colleagues.

13. Monitoring and Review

13.1. This policy will be reviewed on an **annual** basis by the **science subject leader**.

13.2. The **science subject leader** will monitor teaching and learning in the subject at the school, ensuring that the content of the national curriculum is covered across all phases of pupils' education.

13.3. Any changes made to this policy will be communicated to all teaching staff.

13.4. The next scheduled review date of this policy is **October 2024**.

This policy operates in conjunction with the following school policies:

- Special Educational Needs and Disabilities (SEND) Policy
- Feedback Policy
- Assessment Policy
- eSafety Policy
- Equal Opportunities Policy