Science Rationale

What We Teach and Why We Teach it!

How do we teach our science curriculum?

Early Years (Nursery and Reception) – teach science through continuous provision and Forest Schools with adult's supporting the children exploring the natural world and making observations using Birth to Five Matters for guidance.

Key Stage 1 (Yr. 1-2) teach science through continuous provision with adult directed tasks.

Key Stage 2 (Yr3– Yr6) teach an explicit 1 hour science lesson weekly.

Every KS1 and KS2 year group use the Science Bug Scheme to teach their unit through.

We do this because following the disruption to teaching caused by Covid we decided that we needed a consistent, whole school approach to teaching. The tasks and worksheets use high quality questioning and vocabulary to support learning. They include opportunity for discussion and practical hands on learning. The progression within the lesson is clearly evident, ensuring that children understand the science knowledge before moving on to science skills-based tasks. The skills-based tasks allow children to apply their science knowledge learnt previously.

Why we use the Science Bug scheme of learning as a planning tool?

At Collierley, we use Science Bug because following a review of the science curriculum, we felt that the sequence of learning within the scheme was the most effective way of ensuring that our children make progress across each unit and through each key stage. The scheme ensures consistency across school and shows clear progression as each unit builds on children's prior knowledge learnt from previous units. The Science Bug scheme allows for more practical hands-on learning creating engaging lessons, often involving high-quality resources to aid understanding of science skills. Each lesson has opportunities to use precise questioning using scientific vocabulary to measure conceptual knowledge and skills and assess children regularly to identify those children with gaps in learning, so that all children keep up.

How do we use assessment in science?

KS1 and KS2 use teacher assessments to assess the children termly.

We do this because we use this data to inform our judgements on where the children are in regards to their age-related expectations. This data is also used to identify any children who are off track and identify who may need extra support. This is collected termly and the data is imputed into Insight for data collection.

KS2 – Pre- unit assessments are used before teaching each unit.

In Key Stage 2, these are used to assess the children's prior knowledge of the unit. We do this so that teaching can be prioritized so that objectives that children don't know are taught more in-depth. The objectives that children have some understanding of can the be taught through starter tasks. The results are just collected for individual teachers' use and it is not expected that these are recorded anywhere. In Key Stage 1, it was decided that the pre-unit tests weren't appropriate as they were very time consuming. Teachers use high-quality questioning and teacher judgment to gauge children's prior knowledge and then plan from this.

KS2 - End of unit assessments are used at the end of every unit taught.

End of unit assessments are use to ensure that children have gained the knowledge that they need to progress. If gaps in knowledge are discovered, these are filled by using these areas at the beginning of each lesson of the next unit. The results are recorded in children's books (next to the pre-unit tests) so that both teachers and the children can see their learning through the unit. These results, along with teacher judgements are then added to the Excel Assessment Science Trackers. This data is then used to identify gaps in children's knowledge and then used to inform planning for the next unit. Gaps in learning are filled during starter tasks at the beginning of each lesson. In Key Stage 1, it was decided that the end-unit tests weren't appropriate as they were very time consuming. Teachers use high-quality questioning and evidence from individual books and floor books to form teacher assessments. This data is then added to the Excel Science Assessment Trackers.

How does our curriculum supports children with SEND?

At Collierley we realise that we have children with widely different abilities in science and all must be given opportunities to display the knowledge and skills they withhold. We achieve this by setting common tasks throughout our science curriculum which will expect different outcomes. Each teacher will adapt their medium term planning to ensure that each lesson has an expectation which can be met by all pupils. We group the children in different ways to enable each child to work on a task which is designed to meet their needs. Teaching assistants can support children either individually or in groups to scaffold their knowledge and development of skills.

How do our children learn more and remember more?

Each year group has a knowledge organiser. This knowledge organiser helps teachers plan appropriate lessons which ensure all of the aims are being met. The children use these organisers in a way of a prompt sheet. The children in KS2 use the knowledge organisers individually whereas the children in KS1 use it through whole class teaching to review and revisit previously taught objectives. The children use these organisers to refresh their knowledge which then allows them to progress and achieve the next given objective. The End of Unit Assessments are use to ensure that children have gained the knowledge that they need to progress. If gaps in their knowledge is discovered, these are filled by recapping these areas at the beginning of each lesson of the next unit. To further enable our children to learn more and

remember more, we spend the first few minutes of each lesson recapping previous learning. This is done through targeted questioning and the use of the knowledge organisers.

This rationale supports the intent, implementation and impact statements for Science in Collierley Primary School.

Intent

Through the teaching of Science, we provide children with the opportunities to:

- Develop their knowledge and understanding of important scientific ideas, processes and skills and relate these to everyday experiences.
- Acquire a curious and questioning mind.
- Develop skills of observation and investigation.
- Collect, retrieve, present and communicate their findings to others in a variety of ways.

These skills will equip all of our children with the abilities needed in the wider world and help prepare them for secondary school and beyond.

Implementation

The delivery of Science contains the following;

- Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers are responsible for the planning of Science and are required to plan for a lesson of science each week.
- Science is taught in units through a combination of whole class teaching, group and individual work. The units are objective lead and to ensure a balanced science curriculum it is essential that elements of the Attainment Targets are taught each year, with a particular emphasis on Scientific Investigation. Planning is to show clear progression through each unit and through each year group.
- Working Scientifically is embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. Investigations and experiments are recorded in 'class floor books' and work are evidenced using a range of ways including photos, shared writing, stem sentences etc. To ensure cross-curricular links, some sections of Working Scientifically can be taught in other subjects. For example: the constructing and interpreting result could be taught in maths, the recording of the method in English as a recount piece of writing.
- The use of precise questioning using scientific vocabulary in class to measure conceptual knowledge and skills and assess children regularly to identify those children with gaps in learning, so that all children keep up.
- Access to outdoor learning and workshops with experts to ensure children develop their understanding of their surroundings.

- In Foundation Stage, children begin to explore the world around them, with specific Science work covered through the Early Learning Goals – The Natural World.
- All children are encouraged and supported to develop their full potential in Science. Some children may require extra support in the classroom and opportunities for consolidation and reinforcement. Activities are differentiated to meet the needs of all pupils.
- Formative assessment is used to guide the progress of individual children in Science. It involves identifying each child's progress in each area of the science curriculum, determining what each child has learnt and what therefore should be the next stage in their learning. Teachers in the course of their own teaching carry out formative assessment informally. Some assessment of learning tasks may include:
    - Targeted questioning in small group discussions.
    - Individual discussions in which children are encouraged to approve their own work and progress.
    - Marking of children's work.
- Summative assessment takes place at the end of each unit, term and at the end of each academic year when a level of the child's attainment is given. This assessment is carried out using a combination of formative assessments and the use of 'End of Unit Tests' which is documented using a Tracker Assessment sheet. These then help draw together a teacher assessment of each child. These assessments are collected by the Science Co-ordinator at the end of each term and academic year.

Throughout our Science teaching, we hope that our children will develop a sense of awe and wonder about the world around them.

Impact

By the time children reach the end of Key Stage 2 children will:

- Be curious about things they observe, experience and explore the world around about them with all of their senses.
- Use this experience to develop their understanding of key scientific ideas and make links between different phenomena and experiences.
- Acquire and refine the practical skills needed to investigate questions.
- Have skills of predicting, asking questions, making inferences, concluding and evaluating based on evidence and understanding and use the skills in investigative work.
- Have language skills through talking about their work and presenting their own ideas using sustained and systematic writing of different kinds.
- Use scientific and mathematical language including technical vocabulary and conventions and draw diagrams and charts to communicate scientific ideas.

The outcomes will be measured using both formative and summative assessments outlined above. The Science Co-ordinator will ensure pupil progress and attainment is maintained

through the monitoring of teaching and learning of Science throughout the school and will regularly meet with the SLT to discuss findings.