Science at Newfield

Everyone Learning Together

The Newfield Way

Intent

At Newfield Primary School, our aim is to provide a dynamic and engaging science curriculum that fosters a deep-rooted understanding of scientific concepts while igniting curiosity and a love for learning in our pupils. We aim for all pupils to understand the relevance of science in their everyday lives, connecting learning to their personal interests and encouraging them to explore the world around them. This is achieved through interactive and engaging lessons designed to promote inquiry, questioning, and exploration, enabling pupils to hypothesise, experiment and develop curiosity about the world around them.

Our ambition is for pupils to leave primary school with a strong foundation in scientific knowledge across biology, chemistry, and physics, and the ability to set up, carry out, and evaluate scientific investigations. This curriculum, centred around these core scientific concepts, provides a coherent and progressive understanding, ensuring that all learners achieve a high standard of scientific literacy by the end of their primary education.

We believe all pupils should see themselves as scientists, and we promote this by offering a range of enrichment activities and relevant role models to aspire to. By connecting scientific learning to real-world applications, we help pupils appreciate the relevance of science in everyday life and its contributions to society and the environment.

At Newfield, we also place a strong emphasis on developing essential scientific skills, such as observation, investigation, analysis, and critical thinking. These skills are fundamental for effective problem-solving and rational decision-making, and we prioritise providing children with opportunities to develop scientific talk and questioning to enable them to present scientific reasoning, apply a variety of enquiry strands, and analyse results. Through building scientific vocabulary and using it in discussions, pupils deepen their knowledge and understanding, empowering them to identify and correct misconceptions.

Our goal is for pupils to acquire essential scientific skills and employ various enquiry types, fostering their own knowledge of science, participating in investigations, and applying this knowledge across their learning experiences. Through exciting and varied learning experiences, we seek to inspire a lifelong passion for science, encouraging pupils to pursue further study in STEM fields and fostering a true love for scientific discovery.

At Newfield Primary School we know that, within the context of SEND, personalisation of the curriculum is key so that each individual's priorities can be considered in order to prepare them adequately for adulthood with the best possible quality of life. Our ambitious curriculum can be successfully adapted to meet the needs of pupils with SEND, developing their knowledge, skills and abilities to apply what they know with increasing fluency and independence. We believe that it is vital that our pupils are equipped with the tools needed to become independent, inquisitive learners in all subjects and that pupils with SEND achieve the very best outcome and reach their full potential.

Implementation

Classroom Organisation
We teach Science in a variety of ways at Newfield, so that all children have access to a curriculum that meets their needs. We have a bespoke scheme of learning, informed by the National Curriculum, which offers a progressive and sequenced framework from EYFS through to Year 6. Science is taught weekly as a whole class.

Science Enquiry and Skills
We ensure that all science lessons use the substantive knowledge that pupils need to learn to enable them to access the disciplinary knowledge and engage with the working scientifically skills taught in each year group. In each lesson, with the support of teachers, pupils will identify which aspect of science enquiry they are focusing on to enable them to develop their working scientifically skills. We also have 10 key science skills that pupils will experience throughout their time at Newfield and teachers ensure that pupils have experiences of these throughout each year. This will enable pupils to achieve the expected standard in science.

Early Years Foundation Stage
Science in EYFS is taught through understanding of the world, by providing children with the opportunities and tools to explore their environment. Pupils are indirectly predicting, problem solving, observing, making decisions and thinking about the world around them through carefully planned activities. Science in EYFS is fundamentally based on pupils' curiosities and interests which encourages them to explore and develop their own scientific knowledge and understanding.

Environment
The classroom learning environment for Science is based on the 'working wall approach' where teachers' modelling and prompts are displayed as part of on-going learning in each classroom. This is where teachers' display specific scientific vocabulary, which is being taught as part of that learning sequence to immerse pupils in rich and technical language. We also focus on 5 key areas of science enquiry that we have on display to ensure pupils are immersed in these experiences.

We also make use of the enriching environment around the school to develop pupils' hands-on learning, such as the pond, the garden, the playground and Roundwood Park. These opportunities allow our pupils to deepen their knowledge and understanding, particularly those pupils who have joined Newfield with limited or no English.

Vocabulary
At Newfield, many children arrive at school with no or very limited English and therefore we ensure that teachers explicitly teach scientific vocabulary at the start of every topic and provide plenty of opportunities for children to practise and embed this vocabulary. It is also vital that pupils are spelling scientific vocabulary correctly.

Trips
Pupils need to be able to link their learning to aspects of the world or environment around them and build upon this. Therefore, we use the local park (Roundwood Park) to enable pupils to make these links and have first-hand experiences, particularly in aspects of science such as plants,

adaptations and habitats. Further to this, year groups take other scientific trips, which link to their current topic, such as the Science Museum or Kew Gardens.

British Science Week and STEM Opportunities

At Newfield we always participate in British Science week, STEM week and projects such as the rail project, to raise the profile of science across the school and develop pupils' curiosity and interests. Teachers support pupils to make connections and build on previous learning to develop their knowledge and understanding further. This week and other STEM related opportunities provide the teachers with an opportunity to prioritise science and at times provide children with an outside expert to further pupils' experiences at Newfield.

Lesson Sequence

Each year group have a yearly overview of the content they need to cover in accordance with national curriculum expectations. These have been planned to ensure correct coverage of all aspects of science and working scientifically as well as building on skills from year to year. Teachers are expected to teach science through vocabulary development, experiments and by using the local environment. Learning is adapted when necessary to ensure that all pupils are able to access it.

We also ensure that pupils have the fundamental skills and knowledge in order for them to be able to access each topic, particularly when children have SEND needs. Therefore, teachers at Newfield have a clear understanding of pupils' prior knowledge and next steps to enable them to plan appropriate learning for each individual.

CPD

At Newfield we ensure that staff have focused science CPD sessions to share good practice, develop subject knowledge and introduce new concepts to develop science teaching and learning further. Teachers also use Reachout CPD and STEM to develop their own subject knowledge for specific topics they will be covering.

Marking and Feedback

Feedback and marking should be completed, where possible, within the lesson. All marking and feedback are given in line with our marking and feedback policy. We aim to ensure that any marking develops the pupils' knowledge and understanding of the science concepts being studied.

Assessment

We use a variety of different methods to formatively assess science including using concept cartoons and Explorify. We also use three questions at the begin of each lesson to check pupils' understanding of last year's learning, a previous topic and the previous lesson. This enables pupils to repeat, recall, consolidate and deepen their knowledge and understanding of different topics.

Summative assessments will be entered into Sonar Tracker at the end of each year. Teachers will use their professional judgement to determine whether a child is working within age-related expectations, above or below. Teachers will use the National Curriculum for each topic, alongside Target Tracker statements as a support for making judgements and to inform planning.

Teachers in Y6 are expected to judge if a pupil has met the expected standard by the end of KS2 as applicable, in line with the national curriculum and TAF.

Full Curriculum

At Newfield, we are aware that we have many pupils join our school part way through their primary school career. This means that many pupils will have gaps within their learning, when they go to high school due to the fact that some aspects of science are only taught in one- or two-year groups. At Newfield we build in basic skills to enable pupils to access topics that they are going to cover by pre-teaching the previous year's knowledge. However, where topics are only covered in a few year groups we communicate this with the local secondary schools to inform them of where specific gaps in children's learning may occur.

Intended Impact

- The percentage of pupils working at age related expectations within each year group will be closer to/or at least in line with national averages.
- The percentage of pupils working at Greater Depth within each year group will be closer to/ or at least in line with national averages.
- There will be no significant gaps in the progress of different groups of pupils (e.g. disadvantaged vs non-disadvantaged)
- There is an increased amount of pupil participation in Science lessons (Ofsted Priority).
- Pupils' presentation of their work reflects their strong attitudes to learning (Ofsted Priority)
- Pupils will be able to use increasingly sophisticated vocabulary in discussions to deepen their knowledge and understanding and remedy their misconceptions in science.
- Pupils will leave primary school being able to make links with the science they have been taught and their local environment.
- Pupils' are curious and have developed working scientifically skills to investigate in science lessons.
- Pupils' have learnt about and can recall famous scientists that they have studied throughout their primary school career.
- High quality learning environments support pupils understanding in science.
- Teachers plan well sequenced science lessons and are clear about their choices for the curriculum that they teach.
- Teachers have a good subject knowledge for science.
- Teachers' judgements in science are accurate.