Woore Primary and Nursery School

Science Profile

"The important thing is to never stop questioning."- Albert Einstein

1. Curriculum Statement

Intent

At Woore Primary and Nursery School, we encourage children to be inquisitive and to question how the world works. Our science curriculum fosters healthy curiosity in children about our universe and promotes respect for the living and then non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the **Working Scientifically Skills** are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

Implementation

All staff at our school, work hard to promote positive attitudes towards scientific enquiry and learning within their classrooms and around school by reinforcing an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves following the Kapow scheme of planning and resourcing, which teachers can adapt and develop to meet the needs of their mixed-aged classes. Through our planning, we involve problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test

conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.

We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating, and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence. Working Scientifically skills are 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. This is developed through the years, in-keeping with the topics.

Children are offered extra-curricular opportunities through access to afterschool clubs, visits, trips, and visitors which help to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught across the school. Alongside this, Curriculum days are also organised, where children can fully immerse themselves within the subject.

Impact

The successful approach at Woore Primary School results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Our engagement with the local environment ensures that children learn through varied and first-hand experiences of the world around them. There is a clear progression of skills and knowledge acquisition which is evident in the children's work and teachers' high expectations in our school. As pupils progress through the school, they become increasingly independent and are encouraged to select their own tools, equipment and materials as well as completing pupil lead investigations and deciding upon their own variables to measure and record. Teachers' assessment of children is ongoing both within lessons and at the end of units, which paired with effective verbal and written feedback pushes children to achieve their potential and make good progress overall. Children passionately engage with and enjoy learning within science, and this is evident in motivated, independent learners with sound scientific knowledge.

2. Teaching and Learning

Pupils across the school, during this year's Science Week, worked collaboratively to create a set of principles that represent our aims and goals for the subject.

These are representative of the teaching and learning within science across the school.

Science is incredible when:

- We are able to apply our Working Scientifically Skills to solve problems, explore, observe and investigate.
- We are curious and encouraged to develop our own scientific questions and work together to discover the answers.
- We are involved in planning and carrying out investigations and are then able to share and present our findings and conclusions.
- We have the opportunity to observe awe-inspiring experiments that promote a sense of wonder and excitement.
- Our learning has real-life applications and is purposeful.

Grid produced and then subsequently used as an initial basis for planning and teaching of science.

This poster informs and represents the way in which science is taught at Woore Primary School to have the greatest and most positive impact on the pupils and staff. In order for pupils to make good progress and be better able to understand and explain scientific concepts, the following strategies have been put into place.

- Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover answers to key questions. This curiosity is celebrated within the classroom and school environment (e.g. through class assemblies, website posts and displays).
- Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forwards. This is achieved through the use of both open and closed questions, where teachers actively challenge children's thinking and understanding.
- Planning involves teachers creating engaging lessons, which often involve high-quality resources, strategies or technology to aid understanding of conceptual knowledge.
- Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils are able to achieve most learning outcomes.
- Working Scientifically Skills are embedded into lessons to ensure these skills are being developed throughout the children's school career. The key knowledge for each topic and across each year group is mapped across the school and checked at the end of each science unit.
- New vocabulary and challenging concepts are introduced through direct teaching, which is continually developed and broadened throughout the years. Scientific equipment is appropriately demonstrated in order to embed scientific understanding.
- Whenever appropriate, teachers find opportunities to develop children's understanding by delivering practically- based lessons or through accessing outdoor learning.

3. Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Children's starting points are identified at the beginning of each science topic and the children are able to convey and record what they know already. At the end of the block, children's knowledge is checked in line with the key knowledge identified prior to the teaching block. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary and teachers ensure that this is developed within each lesson and throughout each science topic. The science curriculum ensures that children are provided with regular opportunities to apply their mathematical

knowledge to their understanding of science, including collecting, presenting and analysing data. Through use of the KWL strategy, children are also able to suggest what they would like to learn at the start of each teaching sequence, and this ensures that teachers are able to adapt the Kapow programme of study to ensure that this is informed by children's interests and to maximise their engagement with and motivation to study science.

4. Assessment for Learning

Children's progress is continually monitored throughout their time at Woore Primary School and is used to inform future teaching and learning. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of challenge.

Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the success criteria. Children are guided towards achievement of the main objective through the use of process based 'success criteria', provided by and explained by the teacher.

Assessment for learning is continuous throughout the planning, teaching and learning cycle. However, children are more formally assessed half termly in KS1 and KS2 using a variety of methods:

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children.
- Considering work/materials / investigations produced by children together with discussion about this with them.
- End of unit assessment tests created by teachers based on the depth and content of their teaching.

In line with the KWL strategy, children identify what they know already about each topic, as well as what they would like to know. This may be used to inform the direction and sequence of teaching. It also ensures a focus on the key identified knowledge of each topic, which is mapped within and across year groups to ensure progression. At the end of each blocked science topic, this key knowledge is checked. Outcomes of work also evidence its acquisition.

In EYFS, we assess the children's Understanding of the World according to the Development Matters statements and the Early Learning Goals.

5. Planning and Resources

At Woore Primary School, teachers are encouraged to plan lessons using their own preferred style of delivery and have access to a range of resources which may be used to inform their planning. We use the Kapow Scheme of work, which is used by staff as a way of providing a starting point from which a topic can be developed. They contain engaging practical activities and reference material which is a great resource when cross-referenced directly with the National Curriculum learning outcomes. Planning for science (both medium and short-term) is monitored by the Headteacher and Subject Leader in conjunction with learning walks, observations and book looks. Individualised feedback is then provided during staff meetings to ensure that high expectations are maintained, and continual professional development opportunities may take place.

We have sufficient, high-quality science resources to aid and support the teaching of all units and topics taught, from EYFS to Y6. We keep these in a central store, where they will be labelled and easily accessible to all staff. EYFS have a range of resources kept in classes, for simple access for children during exploration. The library contains a good supply of science topic books to support children's individual research.

6. Organisation across the School

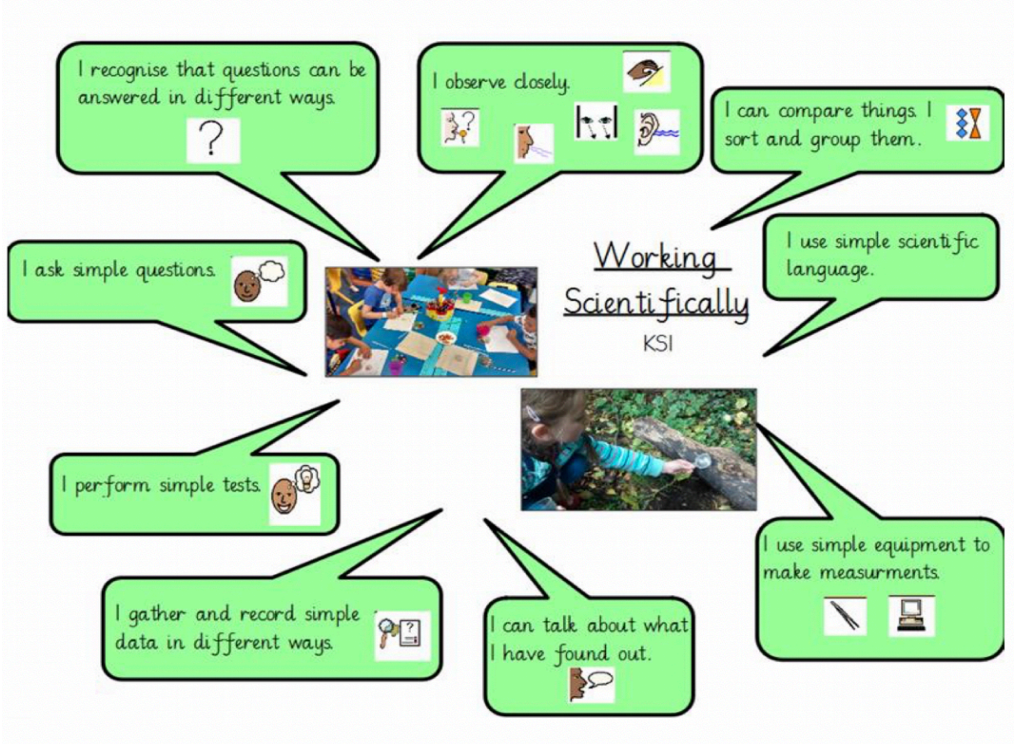
Science is planned for and arranged into an overview for each year group, which details which topic areas are taught at each half term. Topics have been organised to link in with other curriculum areas and topics where possible to improve engagement and encourage cross-curricular opportunities for learning.

The Foundation Stage deliver science content through the 'Understanding of the World' strand of the EYFS curriculum. This involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. They are assessed according to the Development Matters attainment targets.

7. KS1 and KS2

Key Stage 1:

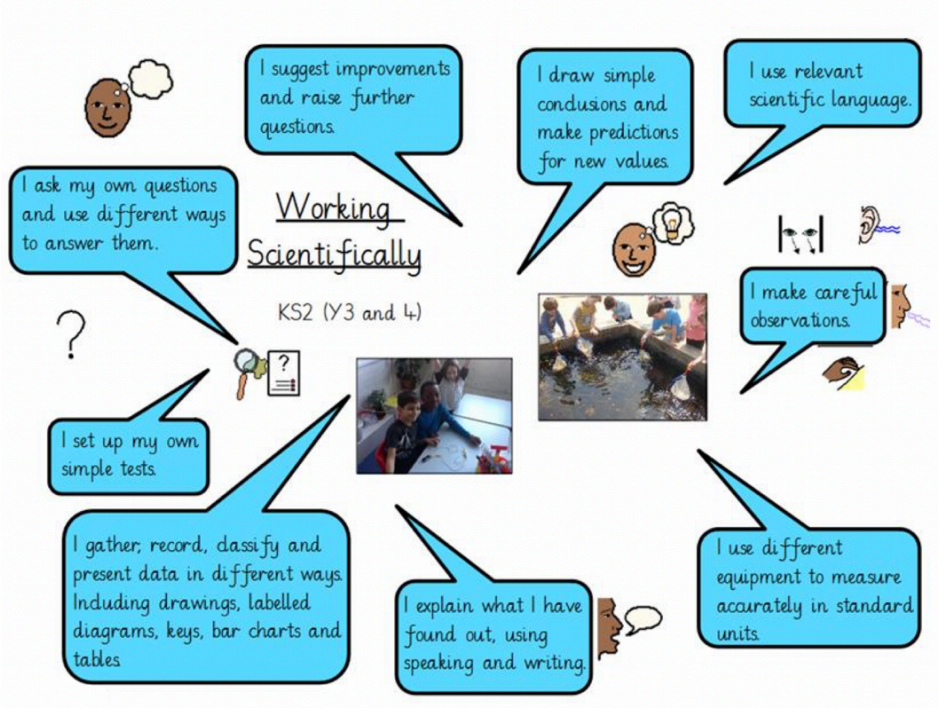
The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.



Lower Key Stage Two:

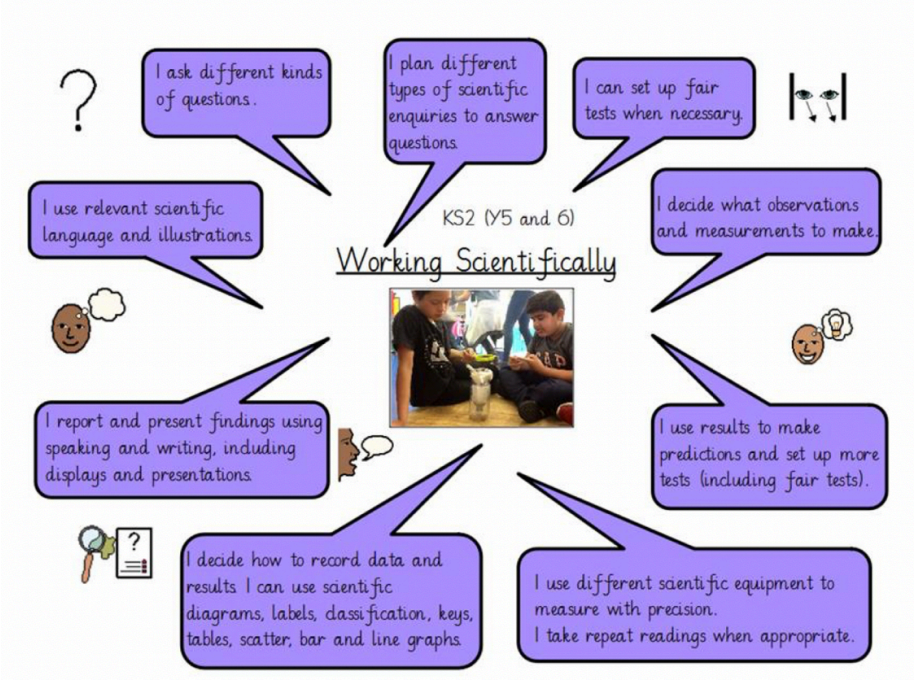
The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple

comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.



Upper Key Stage Two:

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping, and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.



8. Equal Opportunities

We have high expectations for all children. Our aim as a school is to ensure that all children have equal access to a rich and rewarding curriculum, and that they experience this curriculum in ways that are appropriate for their needs, regardless of gender, ethnicity, or any other determining factors. This school is actively promoting equal opportunities by tracking groups who may be a cause for concern. Consequently, we make use of a suitable range of learning activities, teaching strategies, educational materials and digital aids to meet the needs of every individual learner. Every effort is made to ensure that the methods and materials used are free from prejudice or bias against any particular group. Resources will actively promote an awareness of the diverse nature of the world around us.
Children for whom English is an additional language are supported in their use of English and will be given opportunities to make use of their home language to assist their learning and to add to the resources of the classroom.

9. Adapting Learning (including more able)

At our school, we aim to provide the best teaching for all children for them to reach their maximum potential in all areas of the curriculum according to their individual abilities. We identify pupils or groups of pupils that may need additional support and take steps to improve their attainment or deepen their learning. Staff also use precision teaching in order to focus on particular groups of children and timely intervention strategies for identified children to support marking and feedback within lessons. More able children are identified and

suitable learning challenges provided in line with greater depth challenges to assist them to achieve and gain a deeper understanding and mastery of their learning. We identify that a more able child is any child who is attaining beyond their 'age-related expectations', which means they are achieving at a higher standard within their own year group expectations. Higher attaining pupils will be predominantly supported by the class teachers and given activities that allow them to gain further mastery of the learning by applying it in different ways.

10. Inclusion

In school we aim to meet the needs of all our children by adapting our science planning and in providing a variety of approaches and tasks appropriate to ability levels. This involves providing opportunities for SEND children to complete their own projects, with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. We acknowledge that some children will require closer supervision and more adult support to allow them to progress.

11. Staff Development Opportunities

At Woore Primary School, staff development is undertaken as regularly as possible to maintain the high standards of teaching and to incorporate new and fresh concepts or strategies to be used within the classroom. The Science Subject Leader has regular updates and CPD provided through network meetings and then is delivered and shared with staff during PD days or staff meetings.