Oak Meadow Primary School

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Policy: Mathematics

From tiny acorns mighty oaks grow.

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Curriculum Statement - Mathematics

Intent

At Oak Meadow we believe that Mathematics teaches children how to make sense of the world around them through developing their ability to calculate, reason and solve problems. It enables children to understand relationships and patterns in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics. We view mathematics as a creative and highly interconnected subject essential to everyday life, science, technology and engineering, and necessary for most forms of employment.

Through the teaching of mathematics, we aim:

- to promote enjoyment of learning through practical activity, exploration and discussion.
- to provide children with the ability to recall and apply knowledge rapidly and accurately to a range of mathematical problems and situations.
- to promote confidence and competence with numbers and the number system.
- to develop the ability to solve problems through decision-making and reasoning in a range of contexts.
- to develop a practical understanding of the ways in which information is gathered and presented.
- to explore features of shape and space, and develop measuring skills in a range of contexts.
- to understand the importance of mathematics in everyday life.

Implementation

Mathematics at Oak Meadow is taught in blocks throughout the year, so that children can achieve depth in their learning. The programmes of study for mathematics are set out weekly and teachers follow the small step sequence of planning from the White Rose primary schemes of learning. Lessons reinforce skills, challenge pupils' reasoning and develops their problem solving expertise. The lessons provide three stages of challenge to learning through an 'All, Most and Some' approach which develop varied fluency, reasoning and problem solving. Children consolidate the skills they are learning whilst developing their reasoning skills and are provided with further problem solving opportunities in which they are required to justify and explain their learning using appropriate mathematical language and terms. Through the use of concrete resources, the concepts of subitising and conservation of number are secured. The pupils' understanding is extended through relating the 'concrete' stage to the 'pictorial' step. Through using pictures and visual representations, the pupils develop a deep understanding of number and mathematical concepts. Relating this to numbers and mathematical operations involves the 'abstract' stage in which the concrete (practical resources) along with the pictorial representations relates to the numbers we see in calculations.

Impact

One of our principal aims is to develop children's knowledge, skills and understanding. During our daily lessons, we encourage children to ask as well as answer mathematical questions. They have the opportunity to use a wide range of resources, such as number lines, number squares, digit cards, place value counters, base ten, Numicon and small

apparatus to support their work. Mathematical dictionaries are available. ICT is used in mathematics lessons for modelling ideas and methods. Wherever possible, we encourage the children to apply their learning to everyday situations.

Skills Progression

Teachers have identified the key knowledge and skills of each blocked topic and consideration has been given to ensure progression across topics throughout each year group across the school. See Appendix 1 for KS1 and KS2 Maths Skills Progression.

Assessment

Assessment for learning is continuous throughout the planning, teaching and learning cycle. Key mathematical skills are taught to enable and promote the development of children's mathematical understanding. Children in each year group have a maths target sheet for their age related maths targets inside the front cover of their book. This helps to track the children's acquisition and application of key skills through the varied fluency, reasoning and problem solving approaches. Assessment is also supported by use of the following strategies:

- Observing children at work, individually, in pairs, in a group and in class during whole class teaching.
- Using differentiated, open-ended questions that require children to explain and unpick their understanding.
- Providing effective feedback, including interactive marking through next steps questions where appropriate, to engage children with their learning and to provide opportunities for self-assessment, consolidation, depth and target setting.
- Book moderation and monitoring of outcomes of work, to evaluate the range and balance of work and to ensure that tasks meet the needs of different learners, with the acquisition of the pre-identified key knowledge of each topic being evidenced through the outcomes.

At the end of each topic, the acquisition of skills is tested using White Rose Hub materials. At the end of each term, the White Rose Hubs materials (end of term tests) are used and the strengths/areas for development are shared with the Senior Leaders. Each child's attainment and progress in mathematics is formally reported to parents at the end of each term. National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments. Year Four pupils will also undertake the National Multiplication Tables Check.

Early Years

'Every child deserves the best possible start in life and the support that enables them to fulfil their potential.' (Statutory framework for the early years foundation stage)

Mathematics is one of the areas of learning and development set out in the statutory framework for the Early Years. 'Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures.'

At Oak Meadow, we have a firm belief in the acquisition of number skills which will enable children to use their deep learning in order to perform simple skill with numbers and to reason about numbers. They will be able to use their number skills to solve simple problems.

The statutory framework states:

'Numbers: children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.' For this reason, we teach the children their numbers in stages, beginning with a focus on numbers to five. Children will understand the sequence of numbers, how to count up and down in steps of one, how to match them to their respective amounts, one more than and one less than, recognising an amount without counting to five quickly (known as subitising) Children will use a variety of apparatus to achieve this including everyday objects, counters, dice, cubes, number frames (ten frames) Numicon, pictures, and number tracks.

The framework continues:

'Shape, space and measures: children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.' Through a rich, varied enquiry approach with child initiated learning, children will explore everyday objects and contexts to support shape, space and measures and will be taught the language of these concepts.

Cross – Curricular Links

Mathematics is a subject that touches on many other areas taught in our school.
The teaching of mathematics contributes significantly to children's understanding of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, in mathematics lessons we expect children to read and interpret problems, in order to identify the mathematics involved. In English lessons, too, maths can contribute: younger children enjoy stories and rhyme that rely on counting and sequencing, while older children encounter mathematical vocabulary, graphs and charts when reading non-fiction texts. Information and communication technology enhances the teaching of mathematics significantly, because IT is particularly useful for mathematical tasks. Teachers can use software to present information visually, dynamically and interactively, so that children understand concepts more quickly. Younger children use IT to communicate results with appropriate mathematical symbols. Children use it to produce graphs and tables when explaining their results, or when creating repeating patterns, such as tessellations. When working on control, children can use both standard and non-standard measures for distance and angle. They can also use simulations to identify patterns and relationships.

SMSC Development

<u>Spiritual development in mathematics</u>
The study of mathematics enables pupils to make sense of the world around them and we strive to enable each of our pupils to explore the connections between their numeracy skills and every-day life. Developing deep thinking and an ability to question the way in which the world works promotes the spiritual growth of pupils. Pupils are encouraged to see the sequences, patterns, symmetry and scale both in the man-made and the natural world and to use maths as a tool to explore it more fully.

<u>Moral development in mathematics</u>
The moral development of pupils is an important thread running through the mathematics

curriculum. Pupils are provided with opportunities to use their maths skills in real life contexts, applying and exploring the skills required in solving various problems. All pupils are made aware of the fact that the choices they make lead to various consequences. They must then make a choice that relates to the result they are looking for. The logical aspect of this relates strongly to the right/wrong responses in maths.

Social development in mathematics
Problem solving skills and teamwork are fundamental to mathematics through creative thinking, discussion, explaining and presenting ideas. Pupils are always encouraged to explain concepts to each other and support each other in their learning. In this manner, pupils realise their own strengths and feel a sense of achievement which often boosts confidence. Over time they become more independent and resilient learners.

Cultural development in mathematics
Mathematics is a universal language with a myriad of cultural inputs throughout the ages. Various approaches to mathematics from around the world are used and this provides an opportunity to discuss their origins. We try to develop an awareness of both the history of maths alongside the realisation that many topics we still learn today have travelled across the world and are used internationally.

Diversity

Through mathematics, children learn about the diversity of national, regional, religious and ethnic identities; teachers encourage pupils to think about topical political, spiritual, moral, social and cultural issues, problems and events and to use their imagination to consider other people's experiences.

Planning and Resources

Planning is achieved collaboratively with parallel-class teachers and SMART board plans are saved electronically for ease of access. Teachers have identified the key knowledge and key vocabulary that is being taught, as well as the skills that are being developed across each topic. These are also explicitly outlined on each topic medium term plan, which makes explicit links to the national curriculum 2014. The subject topics within mathematics each have detailed objectives and sequence of small steps, again saved electronically to enable staff to access planning structures.
Planning uses the model of the White Rose Hubs materials and follows the fluency, reasoning and problem solving pathway. Staff plan the sequence of teaching to enable the children to elicit their understanding through the use of manipulatives (apparatus) visual representations and abstract (numbers).
Each classroom will be resourced with materials to support the delivery of Maths; such items might include number lines, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, Numicon, counting rods, place value apparatus, dice and other smaller items. Larger materials such as scales, trundle wheels and measuring cylinders will be held centrally in the store cupboards adjacent to the staffroom. Children should be encouraged to use whatever resources are available to them in the classroom and which they feel would be beneficial to help them when completing Maths work. Each classroom should have a display dedicated to Maths; this could be in the form of a working wall, strategy board or problem solving area and pupil voice should be evident.
Children can also use ICT resources, remotely enabling parents to become involved in their child's learning.

My Maths
My Maths, a fully interactive online mathematics learning tool for children is used by teachers to support mathematics learning both in class and at home. Children can be set

homework on My Maths and are encouraged by school to access it regularly at home to support areas of mathematical learning.

Times Tables Rockstars
Times Tables Rockstars is another online resource which supports the acquisition of multiplication and division facts rapid recall. Children are encouraged to access this regularly as it supports the teachers' assessment of times tables recall.

Subject Essentials

The specific requirements for the teaching and learning of mathematics is outlined in the document "Subject Essentials Maths 2019 – 2020" (See appendix 2).

Role of the Subject Leader

The subject leader's responsibilities are:

- To ensure a high profile of the subject.
- To ensure a full range of relevant and effective resources are available to enhance and support learning.
- To model the teaching of mathematics.
- To ensure progression of the key knowledge and skills identified within each unit and that these are integral to the programme of study and secure at the end of each age phase.
- To monitor books and ensure that key knowledge is evidenced in outcomes, alongside and as supported, by SLT.
- To monitor planning and oversee the teaching of mathematics.
- To lead further improvement in and development of the subject as informed by effective subject overview.
- To ensure that mathematics has a positive effect on all pupils, including those who are disadvantaged or have low attainment.
- To ensure that approaches are informed by and in line with current identified good practice and pedagogy.

Equal Opportunities

At Oak Meadow, we are committed to providing a teaching environment which ensures all children are provided with the same learning opportunities regardless of social class, gender, culture, race, special educational need or disability. Teachers use a range of strategies to ensure inclusion and also to maintain a positive ethos where children demonstrate positive attitudes towards others. Support for specific individuals is well considered and planned for, with consideration given to how greater depth and further challenge can be provided for and demonstrated by children who require further challenge.

Inclusion

All pupils are entitled to access the mathematics curriculum at a level appropriate to their needs. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those who are gifted and talented and those learning English as an additional language, and we take all reasonable steps to achieve this. To ensure inclusion, teachers use a range of strategies in line with the school's inclusion planning key. Independent tasks, as well as teaching, are

also well-adapted to ensure full accessibility, as well as to provide appropriate challenge to different groups of learners. The school makes full use of additional adults who are deployed effectively to ensure that identified children are able to make progress in each curriculum area, according to their full potential.

Role of the Governors

Governors are responsible for ensuring the effective delivery of the National Curriculum requirements in mathematics. The subject leader will ensure that the Governing Body is kept up to date with the actions and initiatives which are relevant to the subject. Regular reviews of action plans are sent to the governors throughout the year and the governors meet with subject leaders and provide link governor reports to the governing body annually.

Health and Safety

The curriculum will be delivered in a safe and healthy manner and every effort will be taken to identify risks associated with a curriculum subject/activity (such as maths trails, outdoor mathematical learning opportunities) and the appropriate control measures will be implemented. Pupils will be educated about health and safety issues as and when the opportunity arises throughout the course of normal teaching. Risk assesments will be submitted for all educational off site visits via the Evolve system at least 5 days prior to the visit taking place.