Orchard Community Primary School

Mathematics Policy

This policy was approved by the Governing Body of Orchard Primary School at their meeting on.....

Signed..... Chair of Governors

Version	Date	Author	Reason for Change
0.1	1/2019	FS	New Policy
0.2	1/2023	CB & FS	Policy Review

Review Frequency	Next Review Date
Every 3 years	1/2025

Intent

Mathematics equips pupils with powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills, making links and the ability to think in abstract ways.

When teaching mathematics at Orchard, we intend to provide a curriculum that caters for the needs of all individuals and sets them up with the necessary skills and knowledge for them to become successful in their future adventures.

As a school, we believe that fluency is key. Children need to have a secure understanding of basic principles in order to deepen their knowledge of the maths curriculum further. Through our rigorously planned curriculum, children are encouraged to challenge themselves through the use of critical thinking and efficient and effective approaches to problems which they may face.

We believe that our maths curriculum should create enthusiastic, creative and articulate mathematicians.

Through a varied and inspiring curriculum, we aim to develop the children's problem solving, resilience and reflective skills – skills that can easily transferrable across the curriculum.

Aims

We intend for all pupils to:

- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- Create a vocabulary rich environment, where talk for maths is a key learning tool for all pupils.
- Develop a positive attitude to mathematics through a structured, practical and engaging Maths curriculum which fosters and celebrates each child's contribution and achievements.
- Develop the ability to apply knowledge, skills and ideas in real life contexts outside the classroom, and become aware of the uses of mathematics in the wider world.
- Develop the ability to use mathematics as a means of communicating ideas.

Implementation - Organisation

We use the objectives from the National Curriculum 2014 to support planning and to assess children's progress. The yearly Programmes of Study form a yearly overview which shows overall content of each year group.

Every class from EYFS to Y6 follows the White Rose Maths hub Shceme of learning - based on the National Curriculum - which we have adapted to enable all children to successfully achieve the small steps.

We focus heavily in KS1 on the fluency aspect of maths to support the children's learning as they move up the school into KS2. Here we still focus on the fluency but develop how to apply these skills in problem solving.

Across the year the learning is broken into blocks. Each unit of work is broken into smaller achievable steps that inform teachers planning. Each unit of work encourages an integrated approach to securing strong

fluency, reasoning and problem solving. These are evident in the small steps progress sheets that have been created for each unit of work.

It is the class teacher who completes the weekly plans for the teaching of mathematics using the adapted WRMH 'Small Steps' progression documents. These weekly plans list the specific learning objectives for each lesson and give details of how the lessons are to be taught, as well as the small steps sheets that the children have in their books. Weekly plans are uploaded to the school's Google Drive.

Lessons may be personalised to address the individual needs and requirements for a class but coverage is maintained.

In order to further develop the children's fluency, reasoning and problem-solving, we use a range of planning resources including those provided by the NCETM and NRICH to enrich our children's maths diet.

The large majority of children progress through the curriculum content at the same pace. However, in LKS2 ad UKS2, pupils are grouped according to their needs, with the learning pitched appropriately, and adjustments made through scaffolding. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.

Maths is taught across the curriculum ensuring that skills taught in these lessons are applied in other subjects. We also have whole school maths themed days e.g. House Times Table Athon.

Implementation - Time Allocation

Mathematics is taught as a discrete lesson for approximately one hour, five days a week in Key Stage 1 and 2. Children in KS1 also practise and strengthen their mental maths skills by carrying out the Mental Maths incorporating the use of White Rose app. In Years 3, 4 & 5 and 6 the children frequently use 'Times Tables Rockstars' and complete 3 practice sessions per week on tables set by the teacher and are able to access online quizzes both in school and at home. As links arise, mathematics is also taught in topic to help enable pupils to consolidate and apply concepts taught in discrete lessons to real contexts.

In the Foundation Stage, Maths is taught as a discrete lesson for approximately 25 minutes four times a week, following the White Rose Maths Scheme. In addition, children are given ample opportunities both inside and out, to practice, apply and develop their mathematical understanding of number, number patterns, shape, space and measures and talk confidently about mathematical ideas with adults and their peers.

Implementation – Pedagogy

The school uses a variety of teaching and learning styles in mathematics providing children with the opportunity to engage in practical activities and mathematical games and problem solving investigations alongside the regular practice of the appropriate mental and written methods. Such activities may be completed individually, with a partner, in small groups or as a whole class.

Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge. Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts. Our principal aim is to develop children's knowledge, skills and understanding.

Each lesson begins with a daily revisit sessions/starter activities in each class whereby children are set a maths task to ensure general maths knowledge and fluency are maintained and developed. These may take

many forms but all activities are designed to give the children an opportunity to practice skills developed in previous days, weeks or topics, for example: arithmetic, specific times tables or several questions about a mixture of maths topics. While the class are solving these questions, the staff are able to support children with consolidation or pre-teaching ensuring they are confident with skills required for the upcoming session.

In the initial section of the unit or lesson the children will focus heavily on the fluency element of the maths being taught, once the children become more secure they will apply this to a range of reasoning a problem solving.

Learning is broken down into small, connected steps, building from what pupils already know. The lesson journey should be detailed and evident on flipcharts (Smart Notebook or PowerPoint) and within teacher's paper plans.

Difficult points and potential misconceptions are identified in advance and strategies to address them planned.

Key questions are planned, to challenge thinking and develop learning for all pupils. Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up. During our daily lessons, we encourage children to ask as well as answer mathematical questions.

Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.

We incorporate sustained levels of challenge through varied and high quality activities with a focus on fluency, reasoning and problem solving.

We use the appropriate mathematical terminology in our teaching and children are also expected to use it in their verbal and written explanations.

We use a variety of approaches including concrete, pictorial, abstract approach and a wide range of mathematical equipment and models are used.

We place oracy at the heart of our learning through shared work and class discussions. Use of appropriate vocabulary is modelled throughout lessons by both staff and children, allowing everyone to 'talk like a mathematician'. Pre teaching key vocabulary is a driver for pupil understanding and develops the confidence of pupils to explain mathematically.

Children's explanations and their proficiency in articulating mathematical reasoning, with the precise use of mathematical vocabulary, are supported through the use of stem sentences provided by the teacher. These are either generalisations such as 'When we add using column addition we start on the right', 'There are ___ tens, the value is _____' or rhymes such as 'multiplying fractions is no problem, top times top and bottom times bottom'.

Alternatively, we use sentences stems to help children with their reasoning skills 'I think the answer is_____ because_____'. These sentences stems are also displaying in the classroom.

IT is used in mathematics lessons for modelling ideas and methods with children using computers as a mathematical tool. Wherever possible, we encourage the children to apply their learning to everyday situations.
Teaching Assistants and Learning Support Assistants support small groups to consolidate /extend understanding, and to tailor work to match the needs of individuals.

Resources

There is a range of resources to support the teaching of mathematics across the school. We vary the use of resources based on the children's ability and also the unit of work.

Concrete Pictorial Abstract (CPA) - We implement our approach through high quality teaching delivering appropriately challenging work for all individuals. To support us, we have a range of mathematical resources in classrooms including Numicon, Base10 and counters (concrete equipment).

When children have grasped a concept using concrete equipment, images and diagrams are used (pictorial) prior to moving to abstract questions. Abstract maths relies on the children understanding a concept thoroughly and being able to use their knowledge and understanding to answer and solve maths without equipment or images.

There are also a bank of resources on the Staff Shared Downloads from Deepening Understanding and White Rose Maths that contain teaching slides and tasks. Staff are encouraged to use the resources they need but to ensure that they are returned to the appropriate place when finished with so that other classes can make use of them.

In order to advance individual children's maths skills in school and at home, we utilise Times Tables Rock Stars for multiplication practise, application and consolidation.

Assessment and Monitoring

Formative Assessment (AfL) - Assessment is an integral and continuous part of the teaching and learning process at Orchard and much of it is done informally as part of each teacher's day to day work. Teachers integrate the use of formative assessment strategies such as: effective questioning, clear learning objectives, the use of success criteria, effective feedback and response in their teaching and marking and observing children participating in activities. Findings from these types of assessment are used to inform future planning.

Summative Assessment – More formal methods are used to determine the levels of achievement of children at various times during the school year. We use the NTS Autumn, Spring and Summer papers to monitor pupils' progress. Statutory End of Key Stage Assessment is carried out at the end of Key Stage One and Key Stage 2. Formative and summative assessments are then used by the class teacher to update each pupil's progress on O-Track at the end of every assessment period.

Marking and Feedback

Work is marked in accordance with the school's marking policy. Children's written work is marked on completion of a lesson or a task. A whole class feedback sheet is then completed and appropriate action taken, e.g. planning adjustments to planning or interventions where necessary. Children are informed at the beginning of the next lesson. Where required children may take part in post teaching sessions, or pre-teaching ahead of the next lesson.

Inclusion

We teach mathematics to all children, whatever their ability and individual 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 to 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

with special gifts and talents and those learning English as an additional language, and we take all reasonable steps to achieve this.

When progress falls significantly outside the expected range, the child may have special educational needs. Class teachers, with the support of the school's SENDCOs, will look at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that some additional or different action can be taken to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs. Wherever mathematical targets are set as part of a child's Support Plan or Additional Needs provision e.g. Pupil Premium, teachers will pay regard to such targets when designing lessons or setting individual tasks in mathematics.

Role of the Subject leader

- To provide professional leadership and management for a subject to secure high quality teaching, effective use of resources and improved standards of learning and achievement for all pupils.
- A subject leader provides management and direction for the subject and ensures that it is well managed and organised to meet the aims and objectives of the school and subject.
- While the head teacher and governors carry overall responsibility for school improvement, a subject leader has responsibility for securing high standards of teaching and learning in their subject as well as playing a major role in the development of school policy and practice. Throughout their work, a subject leader ensures that practices improve the quality of education provided, meet the needs and aspirations of all pupils, and raise standards of achievement in school.
- A subject leader plays a key role in supporting, guiding and motivating teachers in their subject. Subject leaders evaluate the effectiveness of learning, the subject curriculum and progress towards targets for pupils and staff, to inform future priorities and targets for the subject.
- Subject leaders identify needs in their own subject and recognise that these must be considered in relation to the overall needs of the school. It is important that a subject leader has an understanding of how their subject contributes to school priorities and to the overall education and achievement of all pupils.