WALFORD NURSERY & PRIMARY SCHOOL

Policy for Mathematics

Reviewed and Updated: May 2022

Date for Review: May 2023

Learning and Enjoyment…
Every Child, Every Opportunity, Every Day!

Mathematics at Walford Nursery & Primary School

This policy should be read in conjunction with the following school policies:

- Calculation Policy
- Assessment Policy
- Marking and Feedback Policy
- Equalities Policy
- SEND Policy

INTENT

At Walford Nursery & Primary School, we recognise maths as an essential life skill and we are committed to ensuring that all children have a positive and meaningful experience of the subject. We aim to present maths as a challenging, exciting and relevant subject in order to promote a confident attitude.

We have a mastery approach to the teaching and learning of mathematics. The rationale behind this approach to teaching mathematics lies within the research from the Teaching for Mastery Specialist Teacher Programme, the NCETM / SHaW Maths Hub as well as the National Curriculum, which states:

The expectation is that most pupils will move through the programmes of study at broadly the same pace.

Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.

Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Children will:

- calculate accurately and confidently using the four operations;
- have quick recall of times tables facts and key age related facts to enable fluency in Mathematics;
- derive answers from knowledge held in their long-term memory;
- reason in Mathematics, using a range of precise mathematical vocabulary, including well-structured stem sentences;
- represent their thinking through the use of models, images and concrete apparatus;
- problem solve, using a range of strategies, including bar modelling, always choosing the most efficient methods;
- demonstrate resilience when tackling a difficult problems and be able to describe the small steps to achieve a solution;
- demonstrate confident in the topics taught within the National Curriculum showing age appropriate fluency, knowledge and skills to reason and problem solve in a variety of contexts.

The intention of the Maths curriculum at Walford is for its pupils to become competent, curious mathematicians. Mathematical skills and knowledge will be taught, explored and revisited so that pupils know more, remember more and can therefore apply more. Children will develop resilience and self-confidence in applying their learning skills and knowledge. The collaboration between peers and their class teacher will drive the learning and inform the content, strategies and real-world contextualisation to maximise on the progress and learning opportunities.

Through wider curriculum links, we strive to embed maths throughout the curriculum, bringing the subject to life. We go beyond the minimum requirements within the National Curriculum as we aim to prepare the children for later life in the 'big, wide world' and for the next step in their education. We need the children to know the relevance of their learning and that maths is essential to everyday life.

IMPLEMENTATION

What does our Mathematics Curriculum look like?

We have adopted a teaching for mastery approach in Mathematics, following extensive CPD for staff, for the planning, delivery and engagement with mathematics. We have shared expertise and good practice with other schools, through SHaW Maths Hub (our local Maths Hub).

We primarily use the NCETM Prioritisation documents supplemented with the White Rose Maths material to plan mathematical units that are explored progressively, drawing on resources, data and suggestions from reliable sources such as NCETM and nrich.co.uk to link mathematical talk and knowledge across the various units, e.g., multiplication and area.

When planning for objective coverage, teachers are expected to take the following mastery strategies into account:

- Small steps as documented in the NCETM Prioritisation documents and White Rose materials.
- Ping- pong style of delivery - bouncing ideas, concepts and theories around the classroom (maths talk is vital).
- Implementing the Concrete, Pictorial and Abstract (CPA) approach to introducing, exploring and applying mathematical concepts.
- Plan and thoughtfully consider key questions and mathematical vocabulary at the entry points of a lesson/ units.
- Provide multiple opportunities for verbal and written/drawn reasoning (explaining and using mathematical vocabulary to explain methods or reasoning) within unit exploration.
- Inclusion of relevant problem-solving opportunities, where children are expected to draw on and apply multiple concepts to address or approach a challenge.
- Displaying, modelling and sharing of efficient and accurate methods (with parents/ carers whenever possible).
- Opportunities to explore maths concepts/objectives at 'greater depth'.
- Include all learners, providing relevant support for those with additional needs (educational, medical or otherwise).

Cold and Hot Tasks are used to assess children's prior learning (Cold Task) and knowledge and skills at the end of a unit of work (Hot Task). Teachers use summative assessments published by NfER and input data to SIMs to track every child each term.

End-of-year assessment will be completed in May (Years 2 and 6 SATs) or June (rest of the school) to provide a snapshot of individual annual progress. In addition, NFER assessments are undertaken in Year 1 – Year 6. Teachers will use these to track progress and identify areas of need for their cohort.

Teachers are expected to audit their subject knowledge of Maths; completing personal research (as and when necessary) to ensure their own teaching of concepts is accurate and appropriate for their year group. The Maths Leader, with the support of the SHaW Maths Hub, will provide training, planning support and 'book look'/ environment feedback to improve staff confidence and expertise, ensuring a consistent approach from EYFS through to Year 6 (including Year 7 transition).

Mathematical Aims

We aim to ensure that pupils:

- become **fluent in the fundamentals** of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils 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 problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions;
- foster positive attitudes towards mathematics by **developing pupils' confidence, independence, persistence and co-operation skills.**

At Walford, we believe that mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are organised into distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge and understanding to science and other subjects, and will be provided with opportunities to do so.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. 'Live marking' and incisive, verbal feedback alongside written feedback will identify those children rapidly within a lesson. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice (post teaching intervention, homework etc.), before moving on.

Teaching Principles

1. Teachers believe the vast majority of children can succeed in learning mathematics in line with national expectations.
2. The whole class are taught mathematics together, with little differentiation by acceleration to new content. We do not group / set by ability. The learning needs of individuals are addressed through carefully scaffolding, questioning and appropriate rapid intervention where necessary, to provide support and challenge. Children with SEND are provided learning opportunities to match their needs and ensure progress for those individuals.
3. The reasoning behind mathematical processes are established. Teacher / pupil interaction explores *how* answers were obtained as well as *why* the method worked and what might be the most efficient strategy.
4. Precise mathematical language is used by teachers so that mathematical ideas are conveyed with clarity and precision. Specific time at the start of each lesson is dedicated to exposing and using new, mathematical vocabulary. We strongly believe this provides equity to all learners, including those with a special educational needs.
5. Sufficient time is spent on key concepts to ensure learning is well developed and deeply embedded before moving on. Paired talk is used to consolidate learning: children are often asked to share a method or explain/ reason with a partner.

Features of a lesson

1. Lessons last for approximately one hour each day of the week. It begins with a teacher and/or TA input which then allows ample time for independent practice. Independent tasks should include fluency tasks, reasoning, problem solving / higher- order-thinking activities.
2. Lessons are sharply focused with one new objective (WIL) introduced at a time.
3. Difficult concepts and potential misconceptions are identified in advance and strategies to address them are planned (pre teaching where possible/ use of concrete apparatus etc.).
4. Feedback should be provided within the lesson and / or after the lesson where necessary, in order to allow children to move on swiftly in their learning.
5. The use of high quality materials are used to support learning (Nrich, NCETM, White Rose materials, etc.).
6. There is regular interchange between concrete/ contextual ideas and their abstract/ symbolic representation.
7. Making comparisons is an important form of developing deep knowledge. The questions, ‘What is the same/ different?’ are often used to draw attention to essential features of concepts.
8. Teacher- led discussion is interspersed with tasks involving pupil-to-pupil discussion and completion of time- focused activities.
9. The majority of lessons begin with a Flashback 4 in order to review prior learning.
10. Children are encouraged to consider, ‘What is in my takeaway bag?’ to reflect on the key learning points from the lesson (Nuggets of Knowledge).

Classroom Ethos

1. Everyone can learn mathematics to the highest levels.
2. If you ‘can’t do it’, you ‘can’t do it yet’.
3. Mistakes are valuable and should be shared/ learnt from (shared on working walls).
4. Questions are important.
5. Mathematics is about creativity and problem solving.
6. Mathematics is about making connections and communicating what we think.
7. Depth is much more important than speed.
8. Maths lessons are about learning, not performing.

9. Working walls should be current, used and show relevant/ appropriate information for each maths unit.

As a result, we may see less daily formal marking with *lots* of written feedback (however, daily 'live marking' is essential, with feedback given alongside more formal marking).

SEND

The aim is to ensure that all pupils make progress and gain positivity from each lesson. All teachers aim to:

- plan lessons so that all pupils can be included;
- use a range of concrete resources effectively to allow access to whole class or group work;
- organise the class and deploy staff to support group or individual needs.

For children with a special need in mathematics, their target will be included on their group or Individual Provision Map (IPM), where appropriate.

Additional Needs

In order to support children with additional needs:

- questions and tasks are differentiated and sometimes targeted at specific children;
- teachers use a wide range of concrete and pictorial models and images as visual resources to illuminate meaning for all pupils;
- during whole class teaching, discrete help is given to particular children wherever possible;
- during activities, children are supported by teachers or teaching assistants where appropriate to the learning;
- same day intervention ensures that misconceptions are addressed in a timely fashion.

Intervention Programmes

Teaching is focused, rigorous and thorough, to ensure that learning is sufficiently embedded and sustainable over time. Long-term gaps in learning are prevented through speedy teacher intervention. More time is spent on teaching topics to allow for the development of depth and sufficient practice to embed learning. Carefully crafted lesson design provides a scaffolded, conceptual journey through the mathematics, engaging pupils in reasoning and the development of mathematical thinking. The timetable has been adjusted so that 'same day intervention' is possible.

At times, children may need specific 1:1 support in order to 'keep up' with the rest of the class. The following intervention programmes are used, when appropriate, to help children who are currently performing below age – related expectations:

- Mastering Number
- Success at Arithmetic
- Power of 2
- Numicon
- Times Tables Rock Stars

These are usually taught by teaching assistants, class teachers or the SENCo, through small intervention groups in addition to class lessons.

Extending More Able Pupils

As outlined in the NCETM materials, teachers will adhere to 'Teaching for Mastery': a set of pedagogic practices that keep the class working together on the same topic, whilst at the same time addressing the need for all pupils to master the curriculum and for some to gain greater depth of proficiency and understanding. Challenge is provided, by going deeper, rather than accelerating into new mathematical content.

Children who are capable of achieving above age related expectations will be identified from Year R. These children will be monitored, through termly progress meetings, to ensure experience of the curriculum in depth, in order for them to achieve mastery at greater depth. Regular staff CPD ensures that teachers have an understanding of the difference between those achieving mastery and those working with mastery at greater depth.

Equal Opportunities

It will be ensured that all pupils will have equal access to the full mathematics curriculum. For further details, see the school's Policy for Equalities.

EYFS

We follow EYFS curriculum / Development Matters guidance for Mathematics. Through this guidance, we are committed to ensuring the confident development of number sense and put emphasis on the mastery of key early concepts. Pupils explore, experiment with and investigate numbers and become aware of key models and images (tens frame, Numicon, part- part whole etc). Teachers use the concrete- pictorial- abstract approach to conceptual development.

Morning Maths

Children in undertake morning activities from 8:30 am. This can be an opportunity to partake in daily arithmetic practice or undertake activities where children need to apply their reasoning skills.

Working Walls

Each class has a 'mathematics working wall' where children can view daily learning, mathematical vocabulary and where efficient methods, misconceptions or mistakes can be discussed and used as a teaching and learning point.

Homework

All KS1 / KS2 teachers set regular online work to be completed on Showbie as deemed appropriate by the class teacher. Teachers may offer additional resources for home learning as deemed appropriate, e.g. learning tables, Sumdog, Times Tables Rock Stars, Numbots, etc.,

IMPACT

Our Mathematics curriculum facilitates sequential learning and long-term progression of knowledge and skills. Teaching and learning methods provide regular opportunities to recap acquired knowledge through high quality questioning, discussion, modelling and explaining, to aid retrieval at the beginning and end of a lesson or unit. This will enable all children to alter their long-term memory and know more, remember more and be able to do more as mathematicians.

The exploration of mathematics should be interactive and engaging, with content made relevant to children's real- world experiences and contextualised thus to support consolidation and retention of knowledge and skill.

Children should approach mathematical study with confidence and enthusiasm, and view tasks and challenges that call for application of varied knowledge across units of work with resilience and a willingness to collaborate.

Approach and response to reasoning activities should improve term on term, with the expectation that by the end of the year, children are happy to accurately define and use mathematical vocabulary introduced by their teacher, as well as complete stem sentences to complete mathematical statements or reasoning.

Teaching and support staff should also see mastery maths as an opportunity to highlight and further improve concepts that have a clear impact on progress and learning, while also analysing and evaluating practice to ensure it is enhanced and strengthened.

THE NATIONAL CURRICULUM

Knowledge, Skills and Understanding

In KS1 and KS2, teachers use the National Curriculum for Mathematics as the basis of our mathematics teaching to ensure complete coverage of all aspects of mathematics. To supplement this further, we use our agreed approach stated in our Maths Calculation Policy, which guides our children though the four operations from EYFS to Year 6. This immersion in mathematics from EYFS to Year 6 ensures that from an early age, children become competent in mathematics, fostering their ability to:

- secure number facts, such as number bonds, multiplication tables, doubles and halves;
- calculate accurately and efficiently, both mentally and in writing;
- draw on a range of calculation strategies;
- make sense of number problems, including non-routine 'real' problems;
- develop spatial awareness and an understanding of geometry, statistics and measure.

Breadth of Study

At Walford, we believe that mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. We begin this representation exposure in our EYFS setting. The programmes of study are organised into distinct domains (we use the **NCETM Prioritisation documents** and **White Rose Materials** to ensure coverage, progression and consistency of approach/ models/ images etc.), but pupils should make

rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage.

Through careful planning and preparation, we aim to ensure that throughout the school, children are given opportunities for:

- practical activities with concrete resources and mathematical games;
- problem solving across the curriculum;
- individual, group and whole class discussions and activities;
- open and closed tasks, providing opportunity to investigate mathematical concepts;
- exploring a range of methods of calculating promoting a breadth of learning;
- working with iPads as a mathematical tool, to support conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure.

Cross-Curricular Links

Throughout the curriculum, opportunities are planned to teach, extend and promote mathematics. Teachers seek to take advantage of all opportunities through cross- curricular mathematical challenges. Teachers ensure that pupils are taught programmes of study in geometry, statistics and measure within a broader, cross-curricular approach.

Assessment

Children's progress and attainment is closely tracked through termly assessment which is carried out:

Summative Assessment
Using NfER termly assessments and Hot tasks, pupils are assessed against their year group objectives every half term. National Curriculum tests are used at the end of KS1 and KS2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments.

Formative Assessment
NCETM Mastery Materials help triangulate teacher judgements alongside work in books at the end of each half term. Same day intervention (post- teach intervention) is used through the use of afternoon sessions so that no child is left behind and that they are able to access the learning of the following day.

Role of the Subject Leader

1. Ensure teachers understand the requirements of the National Curriculum and support them with lesson planning ideas.
2. Lead by example by setting high standards in their own teaching.
3. Lead and signposts CPD opportunities.
4. Lead the whole school monitoring and evaluation of teaching and learning in mathematics by observing lessons, modelling lessons, analysing data, conducting book scrutiny and engaging in pupil conferencing.

5. Take responsibility for managing own professional development by participating in external training, private study, engagement in educational research and reading.
6. Keep parents/carers informed about mathematical issues.
7. Keep the school policy for mathematics under regular review.
8. To work closely with the Headteacher / SLT to further develop and monitor the mastery approach to maths.
9. Work with the SHaW Maths Hub to adjust and refine our curriculum for the children at Walford.

Monitoring and Evaluation

Monitoring and evaluation will be carried out by:

- Pupils, as appropriate
- Headteacher
- Mathematics Subject Leader
- External advisors
- Colleagues from other schools

The monitoring of progress is against age related expectations so that pupils falling behind or exceeding targets are swiftly identified and intervention is then provided accordingly on a daily basis, either within the lesson or immediately following the main part of the lesson.

Classroom Observations

The Headteacher, Mathematics Subject Leader and colleagues are responsible for classroom observations and feedback to teachers, to provide professional development and develop further outstanding teaching and learning.

CPD and Staff Development

The ready to progress materials, provided by the Department for Education in June 2020, have been outlined during INSET training, adopted by each class teacher and are incorporated into daily planning. Materials from the NCETM are also used to deliver specific interventions.

Having completed the Maths Mastery training and delivered lessons for other schools to observe, the school has now embedded a range of excellent resources and materials using the CPA approach. Professional discussion regularly takes place within INSET training and staff meetings on the teaching of Mathematics to enable confident mathematicians. The Maths Subject Leader will regularly liaise with the ShaW Maths Hub and keep abreast of developments within the NCETM and from the Department for Education.