



## MATHEMATICS POLICY

### **RATIONALE**

Mathematics is a search for patterns and relationships. It is a creative activity involving imagination, intuition and discovery. Mathematics is a way of solving problems and a means of communicating information and ideas. Every child learns in a way that is unique for that child, but all children learn more effectively when they are motivated. They learn independently and through collaboration creating mathematical fluency. We strive to assist children in becoming confident and competent in mathematics, thus deepening and broadening their understanding. Our aim is to take the abstract maths and put it into the real world, using maths in a range of contexts and realising the purpose of maths in life.

### **AIMS AND OBJECTIVES**

At Norwood we aim to:

- provide a relevant, challenging and enjoyable curriculum for all pupils
- develop a positive attitude and enthusiasm towards mathematics
- develop competence and confidence in mathematical knowledge, concepts and skills
- provide children with the opportunity to understand mathematical concepts through practical 'hands on' activities at a concrete level
- develop children's ability to calculate, solve problems, to reason, to think logically, and to work systematically and accurately
- develop initiative and an ability to work both independently and in cooperation with others; building on other's ideas
- develop an ability to communicate mathematics using both relevant vocabulary and universal symbols
- develop an ability to use and apply mathematics across the curriculum and in real life
- involve pupils fully in all aspects of their learning, including the recognition and assessment of their achievements
- provide children with a mathematically rich environment, with teachers following the school's Non-Negotiables policy
- to provide equal access and opportunities for all children regardless of race, gender, class, disability or ability
- to ensure consistency across the school by following a strict monitoring timetable
- to ensure that CPD is relevant, linked to Performance Management, to keep us up to date with new initiatives and, above all, take us to the next level
- to involve parents in their children's learning.

### **EARLY YEARS FOUNDATION STAGE**

In Foundation Stage all activities are planned through careful observations of the children in their work and play. Mathematics, within Reception, is divided into the Numbers and Shapes strand and the Space and Measures strand. A range of differentiated activities are planned for both indoors and outdoors, including adult-led, adult-directed, independent and child-initiated activities. All activities are aimed at working towards achieving the two related early learning goals in mathematics.

### **PLANNING**

#### **Long-Term**

Teachers use the Achievement Statements, alongside the Progression Frameworks from Rising Stars as their long-term planning. The Achievement Statements will be highlighted and dated once objectives have been covered. This will enable teachers to ensure complete coverage and correct progression throughout the year. The mathematics subject leaders will monitor these overviews regularly and therefore these must be kept in the Mathematics Planning Folder.

### **Short term and Medium-Term**

Before starting a teaching sequence, each teacher must plan a learning journey on the planning circles format. The Rising Stars Progression Frameworks, Rising Stars medium term plans, formative assessments and probing questions will be used to complete these for each area being taught. This learning journey will be displayed in the classroom and on a checklist in the children's books. Teachers must also use review questions before moving onto another area. Within a teaching sequence teachers must ensure they begin new concepts using concrete apparatus, regardless of the children's age or ability. This should be followed by a range of images to support new learning before moving on to more abstract resources.

**Important Note:** Teachers must ensure that their Planning Circles and the daily maths lesson are in accordance with the Teaching and Learning Policy and the Assessment Policy.

### **Fast Maths Learning**

Most foundational skills have to reach a level of automaticity to be of use. For example, addition facts have to be immediately available to children if they are to apply them in real contexts. Fast Learning is based on research of learning that is designed to ensure children achieve high levels of fluency in fundamental maths skills. In order to improve children's mathematical fluency, children are given either an addition or a multiplication grid on a daily basis to complete as quickly as possible.

Fast Learning consists of:

- Children should have all the necessary resources available to them to do alone;
- The tasks are 'against the clock' or need to be completed within the allotted time;
- The children are centrally involved in recording and gauging their own progress on their own personal record blue cards;
- Children's progress against their own benchmarks is publicly celebrated and rewarded;
- Each day's activities are to be self- or peer-assessed before being collected by the teacher to provide oral feedback as required.

### **NUMICON**

In KS1, teachers and teaching assistants must use Numicon to model early number work and provide a Numicon investigation area in each year group. Numicon should also be used in KS2 to model new and/or difficult concepts and also be used for problem-solving activities.

### **CALCULATION**

#### **MENTAL & WRITTEN**

At Norwood we recognise the importance of developing children's calculation skills and therefore, in Year 1 upwards, children must have an opportunity to practise all four operations on a daily basis if possible. Details of our approach to calculation are documented fully in the Calculation Policy.

## VOCABULARY

At Norwood we recognise that it is not just younger children who need regular, planned opportunities to develop their mathematical vocabulary. Throughout the school, teachers in both KS1 and KS2 must plan specific vocabulary that is to be taught each week. Teachers must display these words on their board throughout lessons and refer to them regularly throughout the week. In addition each classroom will possess a number of mathematical dictionaries that children can access during lessons.

## SUBJECT KNOWLEDGE

Each teacher must refer to their copy of 'Mathematics Explained for Primary Teachers' (Haylock, 2011) to ensure their subject knowledge is correct before embarking on a new area in the curriculum. In KS1 teachers must also refer to their copy of 'Understanding Mathematics for Young Children' (Haylock and Cockburn, 2013.) The Calculation Policy sets out a clear progression in formal written methods from Reception through to Year 6 for staff to refer to. The Maths Subject Leaders will continue to deliver staff INSETs on subject knowledge and will advise teachers throughout the year. Teachers are advised to use the NCETM website to support their subject knowledge.

## CHILDREN'S WORK

Children must do their calculations in pencil in their mathematics books and show the methods (workings out). The Learning Objective and short date must be written for each piece of work. Children are to be encouraged to write one digit per square in their mathematics books. **Please see Marking, Feedback and Presentation Policy.** Children's books are regularly monitored by the leadership team and subject leaders to ensure consistency and quality of learning and marking.

## ICT

Teachers should use every opportunity to use ICT in their lessons, especially for modeling images through the use of Interactive Teaching Programs and Excel Spreadsheets. This should only be used to enhance lessons. MyMaths accounts have also been made available for all children.

## IPads and IPods

IPads and IPod Touches can also be used in lessons to improve the children's mental mathematical skills. There are a variety of applications, including times tables, number facts, calculation, shape and measures, which children may access.

## ASSESSMENT AND RECORDING

### Summative Assessments

Each half-term, children working at Stage 1 to 6 will sit a Rising Stars Test, which will be analysed to identify gaps in learning. At the end of the school year children in Year 2 and Year 6 will sit their end of Key Stage assessments in addition to this. **Please see Assessment Map.** Teachers will annotate group records for the achievement statements for their class, showing continual monitoring of the year group expectations.

### Formative Assessments

Although the above tests can provide important information, they are only a snapshot of a child's progress, taken at a moment in time. Therefore, at Norwood, we also use an on-going process

known as Assessment for Learning, which must be central to our classroom practice. At the end of each half-term, teachers will compile evidence of children's achievements and then submit the child's band into the School Pupil Tracker. For those children with Special Educational Needs, the teacher may also conduct the KS1 or KS2 Sandwell Tests. Once teachers have a clear understanding of what the child is able to do, and what they need to learn next, the teachers must then give the children clear, specific targets for the next half-term focusing on number or calculation. These must be discussed at the mentoring meetings and made accessible for children to view at any time.

### **Pupil Progress and Attainment Meetings and Moderation**

Children's progress in Mathematics will be evaluated three times a year with a member of the senior leadership team. The Local Authority will also moderate progress. Staff meeting time will also be dedicated to moderation once a term. The purpose of this is to check the consistency of teachers' judgments after they have made their assessments and to identify and resolve any differences.

### **CLASSROOM AND CENTRAL ENVIRONMENTS**

Teachers must:

- ensure displays are both informative and interactive, with clear labels and challenging questions, which engage and extend children. They can also be used to display children's mathematical work
- ensure classrooms are number and mathematically rich with age and ability, with appropriate displays reinforcing and extending mathematical understanding, knowledge and vocabulary
- ensure resources are accessible and clearly labeled
- refer to Classroom Environment Checklist and year group Non-Negotiables.

### **RESOURCES**

Each classroom has a set of core resources for teaching mathematics. This includes:

- a variety of counting equipment e.g. beads, Numicon and counters
- 30 small whiteboards with pens for mental and oral work
- large teaching 100 square (Key Stage One) and individual 100 squares (Key Stage One and Key Stage 2)
- individual multiplication squares
- a range of number lines including large number, negative number and empty lines for whole class and group sharing
- calculators
- clock sets
- age appropriate rulers that include mm, cm and m
- protractors and compasses (Years 5 and 6)
- shape sets (3D and 2D) including nets
- multi - links and Base 10 Blocks
- money sets (EY, Key Stage 1 and Lower Juniors)
- measuring equipment - containers for capacity and scales for mass
- age and ability appropriate mathematical games, puzzles and books

### **TIME ALLOCATION AND BASIC SKILLS**

Children in Key Stage 2 should have a Mathematics lesson, a 4-A-Day calculation session of approximately fifteen minute and a Fast Learning session every day. Children in Key Stage 1 should also have a daily lesson, and should do either a 4-A-Day or a Fast Learning session. One of these 4-A-Day sessions for both Key Stages may be dedicated to reviewing exercises from the week and correcting errors as necessary. Three mental mathematics tests and three arithmetic tests need to be completed each half term.

## **HOMEWORK**

Mathematics homework is an opportunity to revisit topics from the previous year or from earlier in the present academic year. It is essential that children are able to complete it independently. Maths Blast booklets are used for this, although extension activities can be set on MyMaths if required. Homework booklets are self-assessed with the expectation that they will be monitored by the class teacher. See Homework Policy for details on frequency and the set time spent on Mathematics homework in each year group.

## **CROSS-CURRICULAR**

Teachers must take advantage of all opportunities for children to apply their mathematical knowledge and thinking across other subjects. At Norwood we believe that pupils learn best when they make connections across the curriculum, setting mathematics in real life context. Throughout the school year opportunities exist to extend and promote mathematics, in particular in Science and Topic Work. These objectives will be included on the medium-term plans for each foundation subject where appropriate, with the expectation of at least one per half-term.

## **DIFFERENTIATION**

Within Mathematics lessons we use three types of differentiation to ensure we address the needs of individual children and their mathematical targets. These are:

- differentiation by task, which involves setting different tasks for pupils of differing abilities
- differentiation by support, which means giving more help to certain pupils within the group
- differentiation by outcome, which involves setting open-ended tasks and allowing pupil response at different levels

## **SPECIAL EDUCATIONAL NEEDS**

Every teacher is a teacher of pupils with Special Educational Needs and Disability. Quality first teaching is provided for all pupils in mathematics lessons and this is supported by skilled teaching assistants. A whole school approach underpins success for pupils with learning differences including multi-sensory strategies and a dyslexia friendly environment. Differentiation through activity, resources and outcome is used to maintain the high expectation we have for all our pupils. Some pupils may receive support in the classroom or may be withdrawn for extra support.

## **GIFTED, ABLE AND TALENTED**

To ensure high expectations, we expect our more able children to demonstrate a deeper understanding of mathematics when given the opportunity to do so. While such opportunities should be provided to all children, challenges requiring a greater depth of understanding should be provided so that they allow the children to:

- Analyse their own work to find and correct their own errors
- Synthesise their learning and draw on various strands of mathematical understanding to tackle a single problem
- Evaluate their own solutions and attempt to suggest a more efficient or elegant solution.

## **MONITORING AND EVALUATION**

The following activities ensure the quality of the provision and the attainment of all pupils is closely monitored, so any changes needed are quickly identified and acted upon:

- Lesson observations
- Work scrutiny
- Learning Walks
- Monitoring of attainment/progress of classes/individuals
- Pupil interviews/questionnaires
- Planning scrutiny
- Supporting colleagues in the teaching of mathematics, and keeping up to date with current initiatives

## **EQUAL OPPORTUNITIES AND INCLUSION**

All children will be provided with equal access to the curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background and according to their individual abilities.

## **HEALTH AND SAFETY**

The general teaching requirement for health and safety applies in this subject. We encourage the children to consider their own safety and the safety of others at all times. Teachers refer to the School's Health and Safety Policy and the safety procedures recommended in the DfE 'Health and Safety of Pupils on Educational Visits' guidelines for the educational visits aspects of this subject.

## **ROLE OF SUBJECT LEADERS**

The role of the subject leaders is to:

- work with the School's Leadership Team using agreed protocols for raising standards, monitoring and evaluation
- observe lessons
- work alongside colleagues
- assist with planning, teaching, assessment and reporting of the subject
- lead discussion of the subject at staff meetings
- organise and lead in-service days
- attend relevant in-service training
- prompt others about relevant training
- audit existing resources and advise on the acquisition of new materials
- evaluate the effectiveness of the School's performance annually
- produce an action plan to address areas identified as needing development by RAISE Online, the School Data Dashboard or inspections
- report to designated governor of the subject

## **ROLE OF GOVERNORS AND PARENTS**

Our Governors determine, support, monitor and review the school policies on Mathematics Education. In particular they:

- support the use of appropriate teaching strategies by helping to allocate resources effectively
- ensure that the school buildings and premises promote successful teaching and learning
- ensure that high quality staff are appointed
- monitor how effective teaching and learning strategies are in terms of raising pupil attainment through link visits to the school and in consultation with subject leaders

- ensure that staff development and performance management policies promote good quality teaching and learning
- monitor the effectiveness of the school's teaching and learning policies through the school self-review processes. These include reports from subject leaders and the termly Head Teacher's report to Governors, as well as a review of the in-service training sessions attended by our staff

## **OUTCOMES**

- To ensure a broad, balanced, creative and stimulating Mathematical curriculum
- To present Mathematics in meaningful contexts and to embed a range of practical activities designed to enhance children's mathematical experiences
- To ensure continuity and progression in the children's learning as they progress
- To instill in children a positive and confident attitude towards Mathematics
- To enhance pupil's use and understanding of the language and vocabulary of Mathematics
- To develop pupils' use of ICT
- To highlight cross-curricular links where appropriate
- To involve our parents in their children's mathematical learning, both in school and at home

## **REVIEW**

This policy will be reviewed and updated as required every three years, or earlier if deemed necessary.