



# North Denes Primary School



## Mathematics Policy

### Rationale

*At North Denes Primary School we believe that Mathematics is a key skill that helps us to make sense of the world around us. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to understand and apply their knowledge to solve real life problems. Mathematics offers children a powerful way of communicating. They learn to explore and explain their ideas using symbols, diagrams and spoken and written language.*

*We also believe that Mathematics equips children with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways.*

*Mathematics is important in everyday life, many forms of employment, science and technology, medicine, the economy, the environment and development and in public decision-making. Different cultures have contributed to the development and application of mathematics. Today, the subject transcends cultural boundaries, and its importance is universally recognised.*

### Aims

- *Have a sense of the size of a number and where it fits into the number system*
- *Know by heart number facts, such as number bonds, multiplication tables*
- *Use what they know by heart to figure out answers mentally*
- *Calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies*
- *Make sense of number problems, including non-routine problems, and recognise the operations needed to solve them*
- *Explain their methods and reasoning, using correct mathematical terms*
- *Judge whether their answers are reasonable, and have strategies for checking them where necessary*
- *Suggest suitable units for measuring, and make sensible estimates of measurements*
- *Explain and make predictions from the numbers in graphs, diagrams, charts and tables.*

### Implementation of Policy

At North Denes Primary School, we use a variety of teaching and learning styles in mathematics lessons. Our principal aim is to develop children's knowledge, skills and understanding in mathematics.

We do this through a daily lesson that has a mix of whole-class and group teaching.

During these 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 and small apparatus - to support their work appropriate to their age and ability level. We follow the Maths Mastery



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Programme, where we embrace the 6 part lesson- do now, new learning, talk task, develop learning, independent task and the plenary.

At North Denes Primary School, children use ICT in mathematics lessons where it will enhance their learning, as in modelling ideas and methods. Wherever possible, we encourage the children to use and apply their learning in everyday situations- encompassing the fact that maths is all around us, therefore making links.

In all classes there are children of differing mathematical ability. We recognise this fact and provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies – in some lessons through differentiated group work and in other lessons by organising the children to work in pairs on open-ended problems or games. We use classroom assistants to support targeted groups and to provide in situ feedback to ensure that work is matched to the needs of individuals. We also support children by ensuring that the work they are doing is matched to their needs and offering support through interventions, ideas for depth and applying learning in an unfamiliar context.

At North Denes Primary School, we do this through careful planning and preparation, ensuring that throughout the school:

- *Children are given opportunities for practical activities, role play, implementing the 6 part lesson structure.*
- *the development of mental and oral strategies with an emphasis on speed recall of number bonds and multiplication tables*
- *the development of mathematical vocabulary*
- *problem solving*
- *individual, group and whole class discussions and activities*
- *open and closed tasks*
- *a range of methods of calculating e.g. mental, pencil and paper and using a calculator*
- *understand mathematics through a process of enquiry and experiment*
- *regular use of ICT games to reinforce, develop and enthuse learning*

### **THE NATIONAL CURRICULUM**

The National Curriculum order for mathematics describes what must be taught in each key stage. North Denes Primary School follows the Maths Mastery approach, which provides detailed guidance for the implementation of the orders and ensures continuity and progression in the teaching of mathematics. Each lesson has a clear 6-part structure: do now, new learning, talk task, develop learning, independent task and plenary (also known as move on's).

Every teacher in North Denes Primary School has access to the Maths Mastery hub and has been trained to the necessary standard.



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## **Early Years Foundation Stage**

At North Denes Primary School, children follow the early years foundation stage curriculum. We give all children the opportunity to talk and communicate in a widening range of situations and to practise and extend their range of vocabulary and numeracy skills. They have the opportunity to explore, enjoy, learn about, and use mathematics in a range of situations. Mathematics is planned on a half termly basis and assessed using the criteria from the early learning goals. Mathematics is taught both as a discrete subject and within the whole early years' curriculum to give children opportunities to use their numeracy skills in real life situations. In addition to this, we take part in at least 3 'Maths Meetings' a week in accordance with the Mathematics Mastery approach- ensuring that we are retrieving information regularly.

## **Key Stages 1 and 2**

At North Denes Primary School daily maths lessons are between 45 minutes and one hour depending on the age of the children. There are also weekly plans, which cover the daily content of each lesson. Within both key stages we take part in Maths meetings at least 3 times a week where we go over a range of different concepts to ensure that the children consolidate their learning.

## **Number**

The programme of Study specifies a progression of number-based skills for children to acquire as they develop their mathematical ability. In order to facilitate this, the teaching staff in North Denes Primary School will ensure that:

- *Children will be encouraged to use mental calculations where appropriate*
- *Children will have the opportunity to discuss and develop a range of calculation strategies*
- *Teaching will encourage flexibility of thinking and utilisation of connections within mathematics*
- *Children's computational skills will be developed and consolidated using a balance between practice and application in meaningful contexts*
- *Opportunities will be provided for children to develop their estimation skills, and will be encouraged to estimate answers before completing calculations*
- *Teaching will place a strong emphasis on ensuring children gain a sound understanding of Place Value within the number system*

## **Shape and Space**



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The Programme of Study specifies a progression of skills in Shape and Space for children to acquire as they develop their mathematical ability. In order to facilitate this, the teaching staff in North Denes Primary School will ensure that:

- *Teaching will place emphasis on observing and understanding the properties of 2-D and 3-D shapes*
- *Opportunities will be provided for the practical construction and investigation of shapes*
- *Children will be given opportunities to explore position and movement in real-life contexts, utilising ICT.*

## **Measures**

The programme of study specifies a progression of skills in measures for children to acquire as they develop their mathematical ability. In order to facilitate this, the teaching staff in North Denes Primary School will ensure that:

- *Children will use a range of measuring equipment in meaningful contexts, and be encouraged to make choices regarding the most suitable equipment*
- *Children will follow a progression beginning with direct comparison, through measuring with non-standard units, to measuring with standard units with increasing accuracy*
- *Children will be given opportunities to develop estimation skills in all measures*
- *Teaching will place strong emphasis on ensuring that children understand that all measurement is approximate, and that they can make sensible decisions on the accuracy necessary in different situations.*

## **Handling Data**

The programme of study specifies a progression of skills in handling data for children to acquire as they develop their mathematical ability. In order to facilitate this, the teaching staff in North Denes Primary School will ensure that:

- *Teaching will be designed to ensure that children understand that the collection, representation and interpretation of data is a means through which real-life decisions can be made*
- *Handling data skills are used as a means of solving problems, through a four-point process: Pose a question; Collect data; organise, display & interpret data; Answer original question*
- *Children will be given opportunities to make decisions regarding what information is collected, how it is collected, how information is processed and how it is displayed*



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- *Children will be given opportunities to apply data handling skills in a range of contexts, across subject areas*
- *Children will be given opportunities to develop an increasing range of ICT based handling data skills*

## **Teaching Methods and Approaches**

At North Denes Primary School, lessons generally follow this format - a mental and oral starter, a main activity and a plenary session. In reception the aim is to have prepared the children by the end of the year for a daily 45-minute maths lesson.

The teaching of maths at North Denes provides opportunities for:

- *Group work*
- *Paired work*
- *Whole class teaching*
- *Individual work*

Children engage in:

- *The development of mental strategies*
- *Written methods*
- *Practical work*
- *Investigational work*
- *Problem- solving*
- *Mathematical discussion*
- *Consolidation of basic skills and routines*

At North Denes Primary School, we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. To further support mental calculations, as a school we participate in weekly slots of TTRS (Times Tables Rock Starts); taking part in termly competitions to promote the importance of times tables.

We endeavour to set work that is challenging, motivating and encourages the children to talk about what they have been doing.

## **Parental Involvement**

At North Denes Primary School, we recognise that parental involvement is an important factor in helping children achieve their best and actively encourage parents to become involved with their children's development in Mathematics through:

- *Parents' meetings twice a year, along with opportunities to look at children's work*
- *The school's 'open' attitude to visits from parents/carers, where teachers make themselves available whenever a discussion need is identified.*



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- *Attending Maths events- Maths cafés*
- *Use of the Homework Materials, maths games and subscription to TTRS online learning for use at home*
- *Class newsletters informing them of curriculum information and the different approaches that we teach within school.*

At North Denes Primary School, we recognise the important role display has in the teaching and learning of mathematics by having maths work displayed in the school. Every class has a 'Numeracy Working Wall' which is a visual aid to support children with their work.

## **Resources**

At North Denes Primary School, resources for the delivery of the maths curriculum are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic-specific items are stored centrally. North Denes Primary School uses a variety of materials to facilitate the teaching of mathematics but recognises the need for the teaching of maths to be investigative and grounded in real life circumstances wherever possible.

There is a variety of interactive resources to help with the delivery of Maths throughout the school and these are stored centrally on the staff network.

## **Contribution in Mathematics to Teaching in Other Curriculum Areas**

### **English**

At North Denes Primary School, mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening.

### **Computing**

At North Denes Primary School, the effective use of computing can enhance the teaching and learning of mathematics when used appropriately. When considering its use, we take into account the following points:

- *Computing should enhance good mathematics teaching. It should be used in lessons only if it supports good practice in teaching mathematics;*
- *Any decision about using computing in a particular lesson or sequence of lessons must be directly related to the teaching and learning objectives for those lessons.*
- *Computing should be used if the teacher and/or the children can achieve something more effectively with it than without it.*



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- *Useful suggestions as to integrating computing into units of work are given in the planning section of the Renewed Framework.*

## **Science**

At North Denes Primary School, almost every scientific investigation or experiment is likely to require one or more of the mathematical skills of classifying, counting, measuring, calculating, estimating and recording in tables and graphs. In science, children will for example order numbers including decimals, calculate simple means and percentages, use negative numbers when taking temperatures, decide whether it is more appropriate to use a line graph or bar chart, and plot, interpret and predict from graphs. There is useful information within the Renewed Framework in relation to 'cross-curricular' aspects of mathematics and science.

## **Art, Design and Technology**

At North Denes Primary School, measurements are often needed in art and design and technology. Many patterns and constructions are based on spatial ideas and properties of shapes, including symmetry. Designs may need enlarging or reducing; introducing ideas of multiplication and ratio. When food is prepared, a great deal of measurement occurs, including working out times and calculating cost; this may not be straightforward if only part of a packet of ingredients has been used.

## **History, Geography and Religious Education**

At North Denes Primary School, in history and geography children will collect data by counting and measuring and make use of measurements of many kinds. The study of maps includes the use of co-ordinates and ideas of angle, direction, position, scale and ratio. The pattern of the days of the week, the calendar and recurring annual festivals all have a mathematical basis. For older children, historical ideas require understanding of the passage of time, which can be illustrated on a timeline, similar to the number line that they already know.

## **Physical Education and Music**

At North Denes Primary School, athletic activities require measurement of height, distance and time; while ideas of counting, time, symmetry, movement, position and direction are used extensively in music, dance, gymnastics and ball games.

## **Personal, Social and Health Education (PSHE) and Citizenship**



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At North Denes Primary School, mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views.

## **Spiritual, moral, social and cultural development**

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We often group children so that they can work together, and we give them a chance to discuss their ideas and results. The study of famous mathematicians around the world contributes to the cultural development of our children. Mathematics contributes to children's spiritual development. Children can find shapes and pattern in nature. They can see the order, logic and pattern that numbers offer.

## **Assessment and Record Keeping**

At North Denes Primary School, we are continually assessing our children and recording their progress. We see assessment as an integral part of the teaching process and endeavour to make our assessment purposeful, allowing us to match the correct level of work to the needs of the children, thus benefiting the children and ensuring progress.

## **Reporting**

At North Denes Primary School all parents receive a termly pupil mentoring report of their child's progress and an annual written report on which there is a summary of their child's effort and progress in mathematics over the year. Parents also have opportunities to discuss progress at two parent's evenings and have access to their year groups email address.

## **Equal Opportunities**

At North Denes Primary School, as a staff, we endeavour to maintain an awareness of, and to provide for equal opportunities for all our children in mathematics. We aim to take into account cultural background, gender and Special Needs, both in our teaching attitudes and in the published materials we use with our children.

## **Special Educational Needs**





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At North Denes Primary School, wherever possible we aim to fully include SEND children in the daily mathematics lesson so that they benefit from the emphasis on oral and mental work and by listening and participating with other children in demonstrating and explaining their methods.

Where necessarym teachers will, in consultation with the SENCO, draw up a target within an Individual Educational Plan for a child. If a child's needs are particularly severe, they will work on an individualised programme written in consultation with the appropriate staff.

When planning, teachers will try to address the child's needs through simplified or modified tasks or the use of support staff.

Where appropriate, a group educational plan is developed with common objectives and learning targets for a group.

## **Role and Responsibilities of Mathematics Subject Leader**

- *Monitor planning, teaching and learning in mathematics, to ensure continuity and progression.*
- *Ensure there is a well sequenced and progressive curriculum map which contains the key knowledge, skills and vocabulary children need to be procedurally fluent in mathematics.*
- *Monitor standards in mathematics throughout the school, including SEND, more able, LAC, etc.*
- *Identify strengths and areas for improvement and to lead and drive improvements within the school.*
- *Keep up to date with new initiatives and train staff on these (also to facilitate in or out of school training for staff).*
- *Feed back to the Headteacher on standards in mathematics*

## **Monitoring and Review**

At North Denes Primary School, the subject leader supports colleagues in their teaching by keeping them informed about current developments in mathematics, and by providing a strategic lead and direction for the subject. She gives the headteacher an annual summary report in which she evaluates the strengths and weaknesses in mathematics and indicates areas for further improvement.

At North Denes Primary School, we use allocated leadership time to review evidence of the children's work, and to observe mathematics lessons across the school. The quality of teaching and learning in mathematics is monitored and evaluated by the headteacher. A named member of the school's governing body is briefed to oversee the teaching of mathematics. The mathematics link governor meets regularly with the subject leader to review.

This policy will be reviewed at least March 2022.



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## **Disability Equality Impact Assessment**

This policy has been written with reference to and in consideration of the school's Disability Equality Scheme. Assessment will include consideration of issues identified by the involvement of disabled children, staff and parents and any information the school holds on disabled children, staff and parents.