BROCKWELL JUNIOR SCHOOL

MATHEMATICS POLICY
January 2020

INTRODUCTION

At Brockwell Junior School, our aim is to ensure that all pupils access a full, engaging curriculum. Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education, therefore, provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the power of mathematics, and a sense of enjoyment and curiosity about the subject.

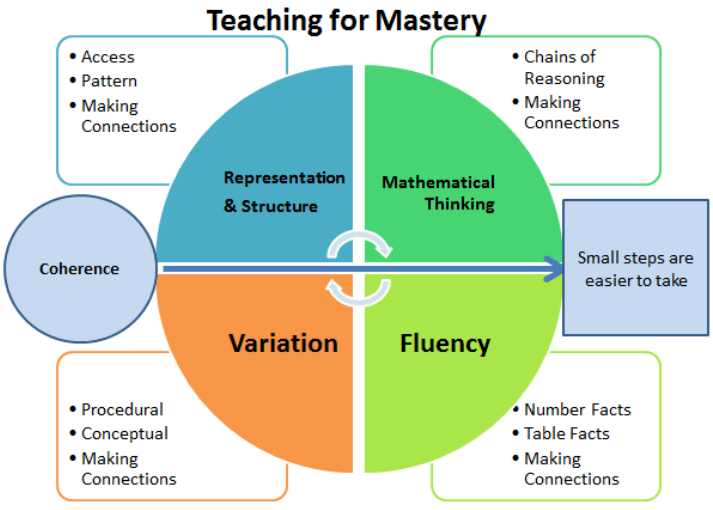
AIMS

At Brockwell Junior School, we teach in accordance with the guidelines laid out in the National Curriculum
The national curriculum for mathematics aims to ensure that all 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
- can **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.

MASTERY

At Brockwell Junior School, the expectation is that all children succeed. We believe that all pupils can become fluent in all areas of mathematics. The key concepts of the mastery approach are outlined on the diagram seen here.



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Coherence
Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning, all steps being small steps.

Representation and Structure
Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation (concrete – pictorial – abstract).

Mathematical Thinking
If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others.

Fluency
Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

Variation
Varying the way a concept is initially presented to students, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practice questions so that mechanical repetition is avoided, and thinking is encouraged.

PROGRAMMES OF STUDY

At Brockwell Junior School, our long-term plan and maths year group expectations will be available to view and download on our school website.

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, by necessity, organised into apparently 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 to science and other subjects. At Brockwell Junior School, where meaningful we make links with real life situations and experiences.

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. At our

school, pupils who grasp concepts rapidly will be challenged by being offered rich and sophisticated problems; this is to ensure they have a deep understanding. Those who are not sufficiently fluent with earlier material will consolidate their understanding, through additional practice, before moving on.

TEACHING AND LEARNING

At Brockwell Junior School, our primary focus is to ensure that pupils understand mathematics and that is why we are following the mastery approach to teaching maths. We aim to help them by using a mixture of concrete apparatus, pictorial representations and abstract calculations. As much as is practically possible, we aim to teach maths by relating to real life experiences as this will engage children and give them a purpose for their learning. Largely, pupils will be taught the objectives within their year group. There are one or two exceptions to this such as pupils with SEN who may be working significantly below their age related expectations; these pupils will have an SEND Learning programme and will have additional support. All children will, therefore, have access to a curriculum that allows them to learn, consolidate their learning and be challenged in order to reach their potential.

We use a range of sources to support the National Curriculum framework and our planning is based around the small steps objectives outlined in the White Rose Schemes of Work. At Brockwell Junior School, we use a range of resources including those from - 'Maths No Problem'and 'Power Maths' - which are text books fully endorsed by the National Centre for Excellence in the Teaching of Mathematics (NCETM). In addition, we have a range of high quality 'extra' resources to ensure maths is engaging. These include Maths Whizz, Numbershark, Doodlemaths, Abacus, Primary Games Community Licence, Prodigy and TTRockStars.

The National Curriculum sets out the objectives, statutory and non-statutory guidance with regards to the teaching and learning of mathematics. Detailed provision can be seen on long and short term plans which are available on the website, staff server and in classrooms.

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LOWER KEY STAGE 2: BELOW IS A BRIEF OVERVIEW OF COVERAGE IN YEAR 3 AND 4

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.
By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

UPPER KEY STAGE 2: BELOW IS A BRIEF OVERVIEW OF COVERAGE IN YEAR 5 AND 6

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
Pupils should read, spell and pronounce mathematical vocabulary correctly.

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CALCULATION POLICY

At Brockwell Junior School, our calculation policy sets out the way that we will teach addition, subtraction, multiplication, division and fractions. All staff have been involved in its development and implementation. It is vital that this policy is followed in order to ensure progression across the school. The appendix to the calculation policy sets out some examples of formal written methods for all four operations which are recognised by the DfE when pupils are tested at the end of KS2.

ASSESSMENT

At Brockwell Junior School, there is ongoing assessment throughout the year. This is a combination of formative assessment (on-going teacher assessment) and summative assessment (more formal termly tests). Formative assessment will inform teachers' planning and day to day delivery of the maths curriculum. Summative assessment will be used to back up teachers' judgements of pupil attainment and to show progression. Pupils who are not making expected progress will be monitored closely and appropriate interventions will be put in place in order to support these pupils. Data will be collected, analysed and reported on by staff at regular meetings with the SLT. Parents will be advised of attainment and progress in maths at parent consultation evenings, in end of year reports, and more often if deemed necessary. Within lessons children are encouraged to use self-assessment to determine their own confidence/ability in mathematical areas. This is used to allocate additional support/intervention appropriately.

MONITORING

The monitoring of maths is carried out by the maths coordinator, head and deputy head. Governors, through the Teaching & Learning Committee, are also actively involved and work with the maths lead with monitoring standards and coverage. Maths is monitored closely by looking at planning, observing lessons, book scrutiny, carrying out staff and pupil interviews. Staff are given positive, constructive feedback and support is put in place as necessary. Details about the monitoring process can be found in the School Action Plan for Mathematics.

RESOURCES

We have a wide variety of equipment stored in classrooms and in a central resource area which support in the teaching and learning of mathematics. All staff have been trained to use concrete apparatus such as Numicon

which supports the teaching and learning of number is a variety of ways. All staff use Base Ten (Dienes), Place Value Counters and Cuisenaire Rods to aid in the delivery of the curriculum.

POLICY REVIEW

This policy will be reviewed as part of the school's annual policy review system.

Julie Cooper
Mathematics Coordinator
January 2020

To be reviewed: June 2021