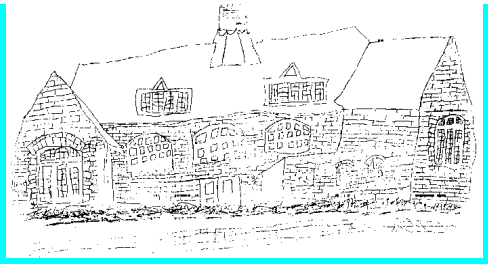


KENTISH TOWN CHURCH OF ENGLAND PRIMARY SCHOOL

Excellent teaching, excellent effort, excellent progress:
Every child, every lesson, every day

MATHS POLICY

A WORKING DOCUMENT FOR ALL OF US

Article 28
You have the right to a good quality education. You should be encouraged to go to school to the highest level you can

Article 29
Your education should help you use and develop your talents and abilities. It should also help you learn to live peacefully, protect the environment and respect other people.

Article 12
You have the right to give your opinion, and for adults to listen and take it seriously.

Article 23
You have the right to special education and care if you have a disability, as well as all the rights in this Convention, so that you can live a full life.

Written by:	**Emma Benham**
Updated:	**January 2024**
Review Date:	**January 2025**

Maths Policy

Context

This policy represents the intentions of the school with regard specifically to the teaching of mathematics from Nursery through to Year 6. It should be considered in conjunction with other policies contained in the School Policies File, which give more detail about Inclusion, Equal Opportunities, Behaviour, PSHE, SEND etc.

Our separate Calculation Progression Guidance document explains how we teach addition, subtraction, multiplication and division at KTS. Our aim is that all pupils are provided with a rich and balanced mathematics curriculum that develops their fluency, reasoning and problem solving – the key aims of the National Curriculum for mathematics.

Our vision for maths

Mathematics makes a significant contribution to modern society as it helps us to understand science, technology, engineering and economics. Children who are confident and fluent mathematicians are well equipped to calculate, reason and solve problems in a range of real-life contexts. Our aim is for pupils to leave KTS fluent in facts and strategies and able to apply these to a wide range of problem-solving scenarios. We aim for them to be able to talk about maths and reason competently, pattern-spotting questioning and challenging the maths they encounter in a variety of real-life situations.

Excellent maths learning takes place when pupils are given opportunities to solve a range of problems by developing their understanding and making links between different areas of maths and apply their skills across the curriculum and beyond.

Excellent maths teaching enables excellent learning to take place. It involves creating a safe, stimulating and collaborative environment in which children can respond to high levels of expectation and challenge.

Our aims in maths

Through our teaching strategies, and school values, our aim is for all pupils to:

- develop high levels of confidence, enthusiasm, enjoyment and resilience in learning maths;
- be engaged and motivated, showing active participation;
- be able to work independently and collaboratively, demonstrating a high-level of mathematical communication
- confidently understand the place value of whole numbers and decimals;
- learn, recall and apply number facts in multiplication tables, doubles, halves and bonds in order to be fluent mathematicians;

- know and use a range of mental and written strategies to calculate confidently and efficiently;
- make reasoned decisions about how to approach, record and justify their mathematics;
- engage with enrichment opportunities in other areas of the curriculum and outside the classroom;
- develop a curiosity to question and generalise, responding to challenges with understanding;
- respond regularly to marking and feedback in order to make rapid progress

Equal Opportunities & Inclusion

In addition to the philosophy set out in the school's Equal Opportunities and Inclusion Policies, we involve all children equally in the teaching and learning of mathematics. We engage all children through the use of stimulating resources, models and images, and through creative and challenging activities.

Planning and Curriculum

In EYFS, teachers in Nursery and Reception classes plan for guided and independent maths learning opportunities using the Statutory Framework for the Early Years Foundation Stage, and in Reception, the NCETM Mastering Number Planning Overview. An emphasis is placed on the building blocks of number and spatial reasoning in the early years so that children develop a strong foundation from which to build. Number sense is prioritised and then systematically developed through the school: cardinality and counting, comparison, subitising, patterning and composition, including 'the story of' numbers 1-10.

The National Curriculum (2014) aims for mathematics are that all children are fluent in the fundamentals of mathematics, can reason mathematically and are able to solve problems by applying their mathematical skill and knowledge. Therefore, our approach to mathematics teaching in Key Stage 1 and 2 aims to cover all of these aspects.

Fluency

Key number facts and maths skills are taught explicitly and practiced frequently. In Key Stage 1 and 2, a fluency lesson (Fluency Fridays) is planned for weekly which focuses solely on developing the key number facts and skills which children should secure by the end of the year. Pupils also build these skills through a daily warm-up activity and guided maths groups in years 5 and 6. In Reception and Key Stage 1, teachers use the NCETM Mastering Number Programme 4 times a week to develop a deep number sense in children and ensure they are fluent when using numbers to 20 before they move to Key Stage 2. We subscribe to the NumBots and TimesTable Rockstars online programmes which children are encouraged to use regularly at home to further secure key number and multiplication facts. In addition, children from year 1 and above have the opportunity to regularly learn and practice key number facts by completing the KTS Number and Times Table Challenges. When a child completes a challenge correctly and within the assigned time, they are rewarded with a medal to recognise their success.

Reasoning
Teachers promote reasoning by providing opportunities to develop mathematical talk within all lessons; modelling the process, making purposeful mistakes, asking open-ended questions and quest, providing tasks which require written reasoning and establishing a classroom environment where rich mathematical talk is valued and encouraged. Pupils respond in full sentence answers and in all maths lessons, teachers provide children with sentence stems to support them to do so.

Problem Solving
Pupils are given regular opportunities within lessons to apply their skills to a wide range of problems placing maths in a variety of contexts. Problem-solving skills are taught through lessons which focus on a particular skill. In Key Stage 1 and 2, teachers plan and teach a bi-weekly 'numberless word problem' lesson which focuses on supporting children's understanding of the language used rather than the values. These support all pupils to access the problem through a 'low-threshold, high ceiling' approach.

Resources used to support planning
Teachers from Nursery-Year 6 use the KTS maths curriculum map for their particular year group. These are termly progression documents created in line with the National Curriculum which provide blocks of teaching paced throughout the year and divided into the key areas of the National Curriculum for maths to ensure coverage and progression. These areas are:

- Number- Place value, Addition and Subtraction, Multiplication and Division, Fractions, Algebra (year 6 only), Ratio and Proportion (year 6 only)
- Measurement
- Geometry -properties of shape, position and direction
- Statistics

At KTS, the Teaching for Mastery approach underpins all of our planning and teaching. The 5 Big Ideas of the Teaching for Mastery approach are:

- Representations and structure
- Variation
- Fluency
- Mathematical Thinking
- Coherence

As well as the KTS maths curriculum map for their year group and the National Curriculum objectives, our teachers use high-quality resources to support their weekly planning. We encourage teachers to draw from other high-quality sources which include White Rose Maths, NCETM's Professional Development Materials, Hamilton Trust and NRICH. The KTS termly maths curriculum maps are 'live' documents which are regularly updated and adapted for the needs of the current cohort and to support the maths leader to make changes where agreed.

There is no requirement to use or hand in a prescribed whole-school weekly planning sheet. However, it is expected that teachers plan an overview of the week's objectives for their own records, based on their termly curriculum map, and to share lesson resources such as PowerPoints or SMART slides on our shared drive so that we can hone these lessons in future, work collaboratively or share with other teachers. An overview of the learning

objectives for the week is then shared with the class team during morning meetings and clearly displayed in each classroom.

Role play, use of games and books and cross-curricular links are particular features of maths planning in the Early Years, Foundation Stage and in Year One, although these approaches also form part of maths planning across the school and particularly for pupils with SEND.

Planning for pupils with SEND
Many pupils with SEND may be working within their current year group expectations but for those who are not, teachers work with the maths subject leader, the SENCO or Teacher in Charge of the ARB to use and adapt planning from the current or a previous year-group that is in line with the pupils' current ability. For pupils working on pre-National Curriculum content, we use the PIVOTS assessment criteria to inform planning and teaching. For those working significantly above their year group expectation in a particular area of the curriculum, we endeavor to provide appropriate enrichment opportunities (see 'Enrichment' section, below).

Lesson Structure and Adaptive Teaching

All classes have a daily maths lesson which lasts approximately 60 minutes. In years 5 and 6, additional group guided maths sessions are taught 3-4 times a week for an additional 15-20 minutes to help prepare children for year 6 SATs.

There is no one model for an effective maths lesson, but with the mastery principles at the heart of our maths teaching, outstanding lessons at KTS ensure that:

- Pupils begin with a warm-up activity to activate prior learning, have the opportunity to practice key skills, develop speed and fluency and recap learning from previous blocks
- New concepts are taught in small steps which link to prior learning and provide opportunities for depth rather than speed
- Teachers model clearly using a CPA approach (concrete, pictorial, abstract) so that pupils achieve deep, conceptual understanding before recording their learning using images, symbols or numbers
- Teachers use an 'I do, We do, You do' approach to teaching to ensure pupils' practice is scaffolded
- Appropriate mathematical language is modelled by the teacher and pupils respond in full sentences using stem sentences to support their talk
- Questioning is used to check understanding, give pupils opportunities to think deeply, consider possible misconceptions, take risks, and pattern-spot
- Pupils are exposed to the maths in a variety of ways to deepen their understanding (conceptual variation)
- Pupils are given the opportunity to spot and explore links between carefully-chosen problems (procedural variation)

- Independent and guided activities are varied and give pupils the opportunity to discuss strategies, work collaboratively, problem solve, reason, and explore open-ended investigations
- The teacher responds to the needs of the pupils during a lesson and will work with focus groups to support and/or extend
- Additional adults support and extend focus children or groups
- All pupils are challenged throughout the lesson through questioning, tasks, solving problems and demonstrating their learning in a variety of ways
- 'Good mistakes' are planned for to address misconceptions and are celebrated in lessons as learning points, underpinned by our whole-school Growth Mindset approach to learning

Adaptive Teaching

KTS is an inclusive school and special care is taken by all staff to ensure that all children have equal opportunity to succeed in maths. Teachers will adapt teaching and tasks in a variety of ways to ensure progress and achievement from each child's starting point, supporting their development as needed through a sequence of lessons. We adapt teaching in a responsive way, including by providing targeted support to pupils who are struggling, as this is what increases pupil success.

Adaptive teaching in maths includes:

- Pre-teaching of vocabulary or a concept
- Use of pictures or videos to contextualise upcoming information
- Improving accessibility (e.g. clarity of resources, font size, proximity to the whiteboard or teacher, use of a laptop, adapted resources)
- Scaffolded tasks
- Providing opportunities for further practice
- Providing a model for a pupil to refer to during independent tasks
- Targeted support from a TA or teacher
- Working collaboratively
- Scaffolding or adapting the language used
- Adapting questioning to support or extend
- Use of a particular resource

From Summer term of Year 2 and across Key Stage 2, pupils use red, yellow and green assessment cups to show their level of understanding throughout each lesson. Adults can then respond to this with further support or challenge (See Assessment Policy for further details).

Teaching should demonstrate the value of a range of strategies in order for children to become efficient mathematicians: there are different ways to solve problems and to record thinking, and children should be encouraged to show and explain their workings, comparing efficiency with their peers. We celebrate and value our differences at KTS, which includes working in different ways!

Recording Learning and Presentation

Across the school, we evidence maths learning as it plays a central role in planning, assessing and most importantly for pupils to use to activate prior learning and see their own learning journey. In EYFS, maths is recorded through photographs, quotes, displays and annotations on planning and shared with parents and carers on Tapestry.

In Key Stage 1 and 2, pupils record their independent work in squared maths workbooks. Each lesson is dated and has a learning objective which is stuck into books in year 1, 2 and 3 and is handwritten by pupils in years 4, 5 and 6. In year 1, pupils begin to record in the squares in their workbooks by the end of the Autumn term and 3-5 pieces of work are evidenced each week. In year 2-6, children are expected to record in their maths books 4-5 times per week, writing one number in each square to ensure neat, clear presentation and clear setting out of calculations supporting them to understand the place value of digits. It is very important that children write, draw and record in maths lessons, rather than only filling in boxes or spaces on a worksheet. Children recording maths for themselves forges memories and builds their knowledge and understanding. It also enables teachers to 'see their thinking' and it reveals misconceptions. For these reasons, we aim for a good balance of children's recording and models and images printed out. As many lessons are practical, evidence of learning is often also shown through photographs or drawings (pictorial).

Interventions

At KTS, we run various maths interventions led by teaching staff and support staff in order to address specific gaps for groups of pupils or individuals. These vary depending on individual and cohort needs and the impact is measured by regular communication with class teachers and the maths leader. Current interventions are:

- Raising the Game: A game-based intervention for pupils in year 2 to close the gaps in subitising and recall of key stage 1 additive facts 2-3x per week
- NumberStacks: A 1:1 intervention in order to close gaps in all or selected maths curriculum areas through short, practical video-based activities 3x per week
- One-to-one tuition: Some pupils receive weekly extra tuition with an experienced tutor which may involve pre-teaching or follow-up teaching in order to close specific gaps or address a learning need
- Numicon Big Ideas: A calculation and number-based intervention (supported by Numicon resources) run 4x per week for a small group in upper key stage 2 in order to secure calculation methods and fluency before the end of key stage 2
- Year 6 Booster: Small group intervention run 1x per week for pupils in year 6 who would benefit from extra guided sessions in key arithmetic skills and reasoning language before they sit the Key Stage 2 SATs

Enrichment

At KTS, we believe that maths learning does not only belong in the classroom; this is just where it begins. We provide regular enrichment opportunities across the school for classes, groups and individuals to ensure children can see and use maths in a variety of situations. These include:

- NSPCC Number Day: a yearly maths-themed day where children dress up in number or maths-themed clothes, take part in different maths activities and raise money for charity.
- National Numeracy Day: a yearly maths-themed day which encourages children and adults to use numeracy skills. We take part in the national competitions

and each class takes part in activities such as baking, rapping, saving and dancing (which all use maths) with the celebrity maths ambassadors.

- Competitions on TimesTable Rockstars: we enroll all pupils from year 2 and above in the regular national competitions in order to motivate and encourage them to practice times table facts. Classes and pupils who play the most are rewarded with certificates.
- Spring Slam: Year 4 pupils take part in completing four timestable quizzes along with other enrolled Camden schools. The quizzes take place over a four-week period and the aim is for pupils to beat their previous score each week and the class average.
- Camden Primary Maths Challenge: a day of competition for four pupils in upper key stage 2 who really enjoy challenging and tricky maths puzzles and problems. They work on challenges throughout the day and compete against other teams in Camden.

Learning Environment

At the heart of the Teaching for Mastery approach is the idea that all pupils are secure in each teaching point before moving on to the next. At KTS, carefully chosen maths manipulatives (concrete resources) in each classroom are key to ensuring children can demonstrate this depth. They must be able to 'do' the maths before they can represent it with images and symbols. Maths manipulatives in each classroom are readily accessible to the children with the most commonly used on display and in clearly-labelled trays underneath. Additional central resources are kept in the maths cupboard.

A maths working wall should be clearly visible in each classroom. From years 1-6, it includes a squared background in order for teachers to provide worked examples to support and scaffold for pupils in lessons. These are updated regularly in line with the current unit of learning and should include questions for pupils to interact with.

Additional adults are a valuable resource and should be fully involved in the daily maths lessons, supporting understanding and discussion, working alongside the teacher, leading a group and marking work, where appropriate.

Assessment, Recording and Reporting

Children's progress is assessed continually and informs day-to-day planning as well as longer-term planning. Effective assessment is achieved by:

- High-quality questioning in order to provide AFL (assessment for learning) throughout lessons
- Teacher observation whilst children are engaged in practical activities
- Discussion with individuals, groups and the whole class during the lesson
- Live marking during lessons
- Marking of written work and pupils' feedback
- Termly problem-solving assessment tasks
- Regular teacher assessment against objectives, which is recorded on Target Tracker, the school's tracking system

- Baseline assessment at the start of Reception
- Statutory Assessment Tasks (SATs) at end of Key Stage 1 and Key Stage 2
- Tracking the impact of the interventions run by additional adults e.g. Number Stacks, Raising the Game, One-to-one tuition, Numicon: Big Ideas and Year 6 Booster groups

Assessment is only useful if it helps the child to make progress. Tests are only effective if the children are given constructive feedback, and if an analysis of the results is used to inform future teaching and plan for any relevant interventions. Teachers formally assess pupils termly and track progress across the year, adjusting planning to meet the needs of all pupils.

End of year National Curriculum expectations are that pupils can confidently and fluently meet the learning intentions set out for each year group.

Assessment procedures are:

- The focus is to be on developing deep and secure understanding of each objective, rather than moving quickly through the curriculum
- Target Tracker is used to record assessment judgements
- Progress is measured in steps, instead of levels
- Good progress for a typical child is expected to be 6 steps across a year. Some children may make more or less progress, and others will need to exceed 6 steps in order to close any attainment gaps
- The aim is for the majority of pupils to have met all the objectives in their year group's curriculum by the end of the year. They will then be considered as having met the expected level. Some children will be working within their current year group's objectives by the end of the year or within a lower year group's objectives. Other pupils will have made further progress and will be working at greater depth.

In EYFS, teachers in Nursery and Reception classes plan for guided and independent maths learning opportunities within the classroom provision, and observe and track pupils' progress using Development Matters.

For further details of assessment procedures, refer to the school's Assessment, Recording and Reporting Policy.

Parental involvement

Parents are informed at the start of each term of the maths units to be covered in their child's class through the class letter. Termly coverage maps for each year group are available on the school's website. The KTS maths curriculum maps are also available to view on the website, as well as an outline of the progression of calculation strategies we teach, to ensure a consistent approach both at school and at home.
Parents are encouraged to talk to their children about maths, support with homework, encourage regular use of TimesTable Rockstars and/or NumBots and to help them practice in everyday situations. Maths days often involve home learning challenges that families can

enjoy together such as taking photos of maths in the real world (i.e. arrays, numbers, shapes).

We regularly arrange informative and entertaining mathematical events, such as coffee mornings and maths workshops to share with parents the methods and resources we use. We aim to support parents to understand what the National Curriculum expectations look like at different key stages in order for them to gain confidence when supporting their child at home. We invite parents to take part with their children and engage in mathematical games, puzzles and activities, and to share the children's enjoyment of and confidence in the subject.

We expect parents to support their children in learning and remembering key maths facts such as number bonds to 10, 20 and 100, halves and doubles facts and times tables. Practicing at home for the Number and Times Table challenge medals from year 1 are a fun and motivational way that parents can ensure their child becomes fluent in number.

Role of the Maths Leader

- To lead maths with enthusiasm, vision and to motivate pupils and staff
- To understand and be able to articulate the intent, implementation and impact of maths at KTS
- To monitor the teaching and learning of mathematics throughout the school
- To attend relevant training and provide internal and external training to staff with the aim of improving the quality of teaching and standards of achievement
- To manage the cost centre and keep clear records of expenditure
- To purchase such teaching materials as are required to provide a high standard of maths teaching for pupils across the school
- To monitor and update the medium-term planning of maths (where necessary) and provide feedback to teachers
- To monitor the attainment of pupils in mathematics and analyse assessment data through Target Tracker and pupil progress meetings
- To provide advice and support to teaching staff, support staff and parents when required
- To deliver high-quality INSETs to staff in order to move teaching and learning forward
- To keep abreast with current research and use relevant evidence to inform necessary changes to the provision of maths
- To audit current provision and formulate action plans for future development

Governors

- A link Governor is allocated to liaise with the Maths Leader (currently Colin Reader.) They may arrange to meet with the subject leader and to visit maths lessons. They should be aware of achievements and developments in mathematics in the school.
- The Governors are required to approve and review this policy.

To be reviewed January 2024.

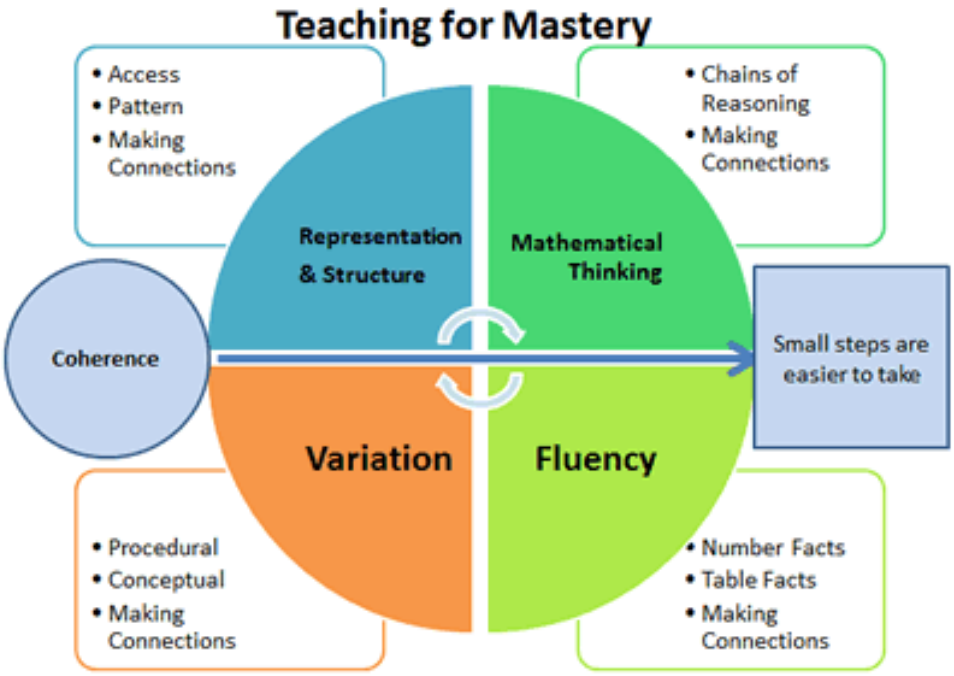
Appendix 1

What is Mathematics Mastery?

Taken from the NCETM (National Centre for excellence in the teaching of Mathematics)

Since mastery is what we want pupils to acquire (or go on acquiring), rather than teachers to exhibit, we use the phrase 'teaching for mastery' to describe the range of elements of classroom practice and school organisation that combine to give pupils the best chances of mastering mathematics.

And mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that's been taught to enable him/her move on to more advanced material.



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 resorting to the representation.

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 – questioning.

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.