STREATHAM
& CLAPHAM
PREP SCHOOL

Mathematics Policy 2023 – 2024

Person(s) responsible for this policy			
Last review by	**Padraig Carr**	**Review date**	**September 2023**
Date of next review		**September 2024**	

Introduction:

'Mathematics is a creative and highly interconnected 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 mathematical education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the power and beauty of mathematics, and a sense of enjoyment and curiosity about the subject.' (DfE 2013)

This policy outlines the teaching, organisation and management of Mathematics taught and learned at Streatham and Clapham Prep School. Mathematics is a core subject in the New National Curriculum and is taught in accordance with our Teaching and Learning policy.

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

- Calculation Policy (appended to this document)
- Assessment Policy
- Marking Policy
- SEND Policy

• Equality Policy

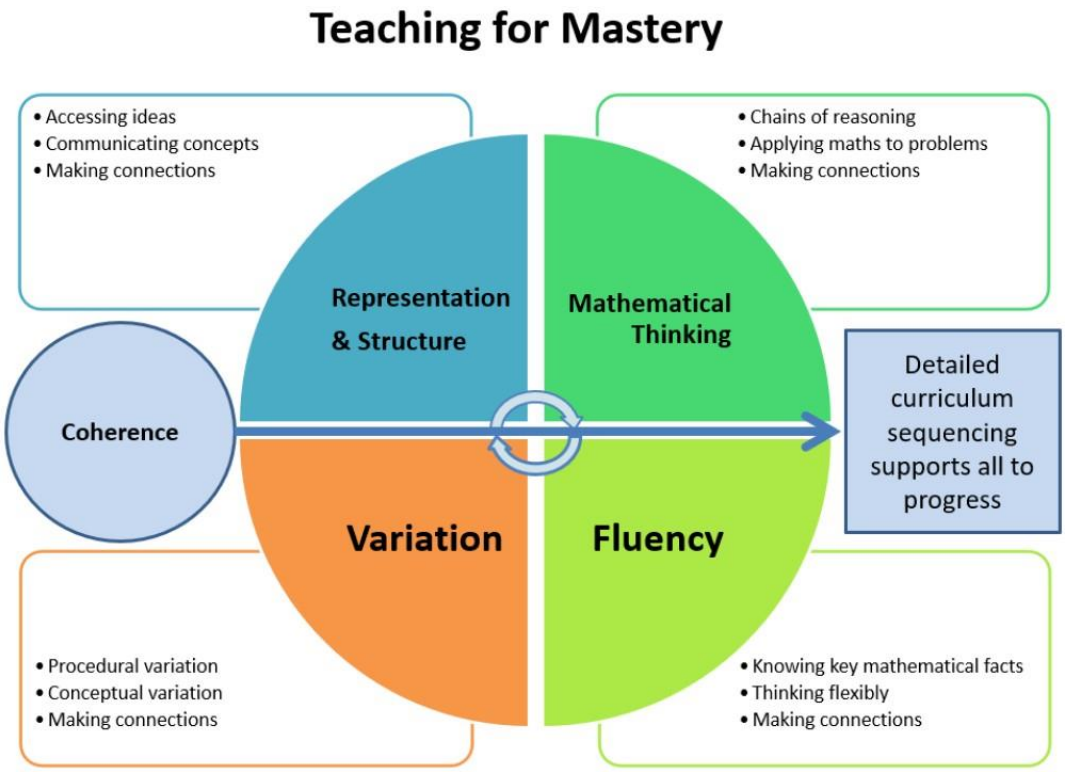
Aims and objectives:

Each child should be able to think and solve problems mathematically by using the appropriate skills, concepts and knowledge. They should be provided with rich and enjoyable experiences related both to their individual needs and to the wider requirements of society. Mathematics teaches us how to make sense of the world around us through developing an ability to calculate, to reason and to solve problems. 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 appreciate the contribution made by many cultures to the development and application of mathematics. There is an emphasis on problem solving and comprehension, allowing children to relate to what they learn and to connect knowledge using careful scaffolding of the core competencies of visualisation, mental strategies and pattern recognition.

The aims of the teaching of Maths at Streatham and Clapham Prep are:

- to promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion
- to develop logical thinking and reasoning skills
- to promote confidence and competence with numbers and the number system
- to become fluent in the fundamentals of mathematics and develop a thorough knowledge of numbers and the number system
- to develop the ability to reason mathematically and solve problems through decision-making and reasoning in a range of contexts
- to develop a practical understanding of the ways in which information is gathered and presented
- for pupils to have the ability to recall and apply knowledge rapidly and accurately
- to explore features of shape and space, and develop measuring skills in a range of contexts
- to understand the importance of mathematics skills in everyday life
- to improve mental maths skills

What is teaching for mastery?



Fluency involves:

• Quick recall of facts and procedures
• The flexibility and fluidity to move between different contexts and representations of mathematics.
• The ability to recognise relationships and make connections in mathematics

Representation and structure:

Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to 'see' these laws and relationships.

Variation:

Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.
Conceptual variation – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical thinking involves:

- Looking for pattern and relationships
- Logical Reasoning
- Making Connections

Coherence:

Teachers should develop detailed knowledge of the curriculum in order to break the mathematics down into small steps to develop mastery and address all aspects in a logical progression. This will ensure deep and sustainable learning for all pupils. As a result of teaching and learning in mathematics, our aim is that pupils will be able to meet the key aims of the National Curriculum for maths.

Teaching and learning style:

A range of teaching and learning styles are necessary for the teaching of Maths. Our main aim is to develop children's knowledge, skills and understanding in Maths. We do this through daily Maths lessons taught in class groups.

Across the school, children are exposed to investigations and problem solving within each area of Maths – number, geometry, measurement, and statistics. The school is using several sources as a basis for planning and resources. In addition, Year 6 have preparation time for their 11+ exams in the Autumn Term. We use Mathletics and Times Table Rock Stars across the school and in Years 4, 5 and 6 we use Atom for additional resources and homework.

Approaches need to be related to the topic itself and to the abilities of the pupils in order to meet the learning needs of the individual pupil. During the lessons we encourage children to ask as well as answers mathematical questions and they are given opportunities to use a wide range of resources.

In our school we aim to promote children's curiosity and enable them to safely take risks and learn from first-hand experience wherever necessary.

- Our primary focus is to support the children to become fluent in mathematical understanding from the most basic level so that they can build upon their own understanding.
- We aim to enable our children to develop conceptual understanding, recall of number facts and patterns and apply their knowledge rapidly and accurately.
- We aim to promote children's ability to reason through opportunities to discuss their thinking and understanding. This emphasis may result in less written work but much deeper understanding.
- We promote problem solving and solution finding. This is not only true in mathematical learning but in almost all aspects of school life.

• We aim to support children to make progress at their own pace. Often misconceptions cause greater difficulties at a later stage of learning. We will promote smaller group learning opportunities whenever possible and encourage children to revisit their thinking to ensure they feel secure in their understanding and able to move confidently on to next steps and challenges.

Our teaching at all levels includes opportunities for:

- discussion techniques and using the vocabulary of Maths (pupil/pupil and pupil/teacher)
- appropriate practical work
- worked examples
- consolidation and practice of fundamental skills and routines
- problem solving
- the committing to memory and recall of a range of mathematical facts
- investigation work
- class work, group work, individual work
- application of learning in everyday situations

Special Educational Needs:

Lesson plans will consider the ALN of some pupils. Where appropriate class teachers liaise with the ALN coordinator to follow the class Provision Map. Monitoring of pupils working below as well as above the average standardised scores is carried out.

Able children are taught within the guidelines of the Able and Gifted Policy. Children who are more able are extended using targeted enrichment activities.

At Streatham and Clapham Prep School we provide opportunities for all to learn and succeed. Therefore, activities in Mathematic lessons are differentiated to support children working below age related expectations and to challenge those who are working at a greater depth. In the following ways outlined below.

Tasks can be differentiated by:

- Support given
- Information provided
- Time extensions/restrictions placed
- Resources available
- Learning styles adopted
- Tasks completed
- Process (the method of teaching)
- Pupil grouping
- Extension work
- Choice and self-direction

Curriculum Planning:

Planning is taught in blocks. Prior to each block, children complete a pre-assessment and then, at the end of the block, a post assessment. This is a clear way to measure short-term progress. Objectives for each block are shared and discussed with the children during the block. This ensures children know their learning targets.

Curriculum planning in Mathematics is in three phases (long-term, medium-term, and short-term). The LTP is created in conjunction with 2014 English National Curriculum for Maths and used as part of the NCETM's Maths Hub programme for Reception to Year 6, which is aligned to several sources to make a bespoke Streatham and Clapham Curriculum. In addition, the Year 6 LTP covers ISEB 11+ preparation for the Autumn Term.

The medium-term mathematics plans, which give details of the main teaching objectives for each term, define what is taught in each year group. They ensure an appropriate balance and distribution of work across each term. These plans are kept on the school system and reviewed by the Head of Maths.

It is the Maths teacher in each year group who completes the short-term weekly plans for the teaching of Mathematics. These plans list the specific learning objectives for each lesson and give details of how the lessons are to be delivered.

EYFS:

We teach Numeracy in our Reception Class. As the class is part of the Foundation Stage of the National Curriculum, we relate the mathematical aspects of the children's work to the objectives set out in the Early Learning Goals, which underpin the curriculum planning for children aged three to five. We give all the children ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics.

Mathematical Development is a **'Specific'** area of development with EYFS. The curriculum is made up of 'prime' and 'specific' areas. Prime areas must be achieved prior to Specific.

Mathematical Development is split into Number and Shape, Space and Measure. Number covers reciting numbers **(i.e. counting, recording, ordering and recognising numerals)** and becoming aware of quantities, comparing them and solving problems. Shape, Space and Measure covers exploring shapes and sizes (i.e. categorising and comparing shapes) and recognizing differences in quantity and ordering objects according to size.

It is taught largely through child-initiated play and learning activities with a range of adult guided activities being built up over the child's time in Nursery.

These can involve:

1. singing number songs,
2. completing number and shape puzzles,
3. playing with shape and patterns,
4. emptying and filling containers,
5. ordering objects according to size,
6. using appropriate shapes in pictures and patterns as well as constructions,
7. counting a range of objects, actions and things that can't be moved.
8. sharing things among a set of people or containers,
9. putting quantities together and playing maths games.

Reception - Year Two:

The Mathematics Mastery curriculum is cumulative - each school year begins with a focus on the concepts and skills that have the most connections, which are then applied and connected throughout the school year to consolidate learning. This gives pupils the opportunity to 'master maths'; by using previous learning throughout the school year, they can develop mathematical fluency and conceptual understanding. Problem solving is at the heart of the mastery approach, so we make sure to dedicate sufficient time to each new concept so every pupil can gain the reasoning they need to solve new problems in unfamiliar contexts.

Years Three to Six:

The fundamental skills, knowledge and concepts are set out in the Mathematics Programmes of Study. Themes are divided into the following main six categories:

1. Number & Place Value – writing, rounding & ordering numbers
2. Calculation – written and mental maths for the 4 operations
3. Fractions, decimals, percentages, algebra and ratio
4. Measurement: units of metric and imperial measure
5. Geometry: properties of shape, position & direction
6. Statistics: diagrams, tables, charts, graphs, averages

Maths in the wider school:

Theme Weeks:

We have themed Maths weeks (such as Enterprise Week, Number Day and STEM Week) in order to develop and embed core mathematical concepts within meaningful and range of contexts.

Links between Mathematics and other subjects:

Mathematics contributes to many subjects within the primary curriculum and where possible opportunities will be sought to draw mathematical experience out of a wide range of activities particularly Science and Computing. This will allow children to begin to use and apply mathematics in real contexts.

Mathematics also contributes to the teaching of English by actively promoting the skills of reading, writing, speaking and listening. This can be done through reading and interpreting Maths problems and facilitating useful discussions.

Educational Visits and trips:

Where possible each class should incorporate Maths into their educational visits and trips. This can be explicit links with Maths as a subject, such as the annual GDST Maths trip to Oxford University. Implicit trips such as trips to the Science Museum or the Victoria and Albert Museum should have elements which make links to the Maths Curriculum.

PARENTAL INVOLVEMENT:

At Streatham and Clapham Prep School we encourage parents to be involved by:
- inviting them into school **twice yearly** to discuss the progress of their child.
- **reporting** to parents in the summer term to discuss progress.
- inviting parents to curriculum **evenings or workshops**.
- circulating curriculum coverage via **Firefly.**
- inviting parents of Year 5 and 6 pupils to **ISEB +11 meetings.**
- Encouraging parents to **help in classrooms** especially during themed Maths week.

Information and Communication Technology:

ICT will be used in various ways to support teaching and motivate children's learning. ICT will involve iPads, laptops, calculators, and audio-visual aids. They will however only be used in a daily mathematics lesson when it is the most efficient and effective way of meeting the lesson objectives.
Teachers use their judgement about when ICT tools should be used.

Assessment and Recording

Assessment:

Assessment opportunities are an integral part of Mathematics lessons. Teachers continually make formative assessments which inform their planning and time is allocated for assessing and consolidating children's understanding especially through the use of mini-plenary sessions. Key questions employed must be noted in plans or slides.

In Foundation Stage:

In Foundation Stage, teachers make formative assessments of pupils through observations during teacher directed and child-initiated opportunities for mathematical development. They track their progress against their 'profiles' which have many learning steps and are outlined in plans. The results are used to target areas of poor performance. They are then assessed against the Early Learning Goal at the end of their Reception Year (Number & Shape, Space & Measure). They will be assessed at whether they have achieved, are still working towards, or are exceeding the goal posts using evidence gathered throughout the year and using the exemplification materials as well as exceeding descriptors.

In Years One to Two:
In Years One to Two, Teachers regularly administer summative assessments using end of unit and end of term assessments, these results are recorded and used to help inform future planning. Alongside this assessment teachers also use Sonar statements which are based on National Curriculum objectives to assess and track the progress made by children in their class. These together with the work in children's books are used to record whether children are working below, towards, at or above their age-related expectations.

In Years Three to Six:
In Years Three to Six, Teachers regularly administer summative assessments using progress tests for each Theme covered and an arithmetic test per half term. **Year Six:** administer Mock 11+ every two weeks in Autumn Term and undertake weekly arithmetic tests.

Recording progression and attainment:

All year groups record results systematically and these are analysed to inform future planning as well as influence intervention groups. Teachers also use Sonar Pupil Progress Tracking which is based on National Curriculum objectives to assess and track the progress made by children in their class. These together with the work in children's books are used to record whether children are working below, towards, at or above their age-related expectations using Sonar. The data is analysed and used in Pupil Progress Meetings to target groups of children to ensure gaps in learning are closed.

This data will be reported to parents twice yearly at parent's evenings, where they will be able to see areas of strength and development.

Resources

There is a range of resources to support the teaching of mathematics across the school. All Lower School classrooms have number lines and a wide range of appropriate small apparatus. Larger apparatus are available from central storage areas. The resources are regularly monitored and updated.

Early Math's Activities
- counters: beads, buttons, unifix cubes, multi-link cubes, attribute bears, pegs and boards, learning links, lollipop sticks
- sorting bowls
- beads, laces, pattern cards

Number and Algebra
- Early math's equipment as above
- Dienes blocks, Cuisenaire rods
- Class number lines (clothes line and pegs style), table top number lines,
- counting sticks
- 5 frame, 10 frame calendar
- hundred square with and without numbers]
- Number fans
- Number balance
- Digit Cards

- Dice
- Fraction, decimal, percentage walls
- pie fraction sets
- Playing cards
- Dominoes
- Notation/transition boards
- Calculators
- Abacus
- Found materials: corks, shells, nuts
- Toy cars, play people,
- Food: hula hoops, dolly mixtures, smartest…

Shape and Space:
- A variety of 2D and 3D shapes
- attribute blocks/logic blocks
- tangrams
- pattern blocks
- construction straws
- Lego
- mobilo
- geo-strips
- geo-boards
- geometric solids [3 D]
- polydrons
- frameworks
- set squares, protractors and compass,
- clinometer
- timetables, TV guides,
- sequencing pictures

Money
- play money
- money stamps
- catalogues, menus, pricelists
- sample cheque book/post office savings books
- euro coins from different countries

Data
- dice
- spinners
- cubes and bags
- direction compass
- meccano
- lollipops
- matchsticks
- junk materials for construction. match boxes, toilet rolls…
- dominoes and card games

Measures:
Length
- non-standard units: playing cards, straws, pencils, ribbon,
- string…
- height chart
- cm rulers
- metre stick
- measuring tape
- trundle wheel
- clinometer

Weight
- balance
- kitchen scales
- bathroom scales
- spring balance
- non standard weights, beads, cubes, corks, conkers…]
- playing cards
- graphs/statistics from newspapers…

Electronic Resources:
- Nrich
- Thinking Blocks
- Primary Games 1-4
- Maths Packs 1-4
- Testbase Questions
- Rising Stars Progress Tests
- Maths Concept cartoons

- interlocking 1 gram cubes
- set of standard weights
- found materials: samples of food (30g bag of crisps)…
- mobiles

Capacity
- a variety of non standard containers, cups, bottles, jugs
- litre, half litre, quarter litre containers
- measuring spoons
- found materials: selection of containers of different size juice cartons, shampoo bottles. spoons,…ladles
- funnel
- 10 cm cube

Time
- sand clock
- water clock
- candle clock
- egg timers
- analogue and digital clocks
- clock faces and rubber stamps
- stopwatch
- calendar

Monitoring and Review

Monitoring of the standards of children's work and of the quality of teaching in Mathematics is the responsibility of the Head of the School, Deputy Head, Phase Leaders and the Head of Mathematics. The work of the Head of Maths also involves supporting colleagues in the teaching of Mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. The Head of Maths forms an Action Plan for the subject in order to evaluate strengths and weaknesses and indicate areas for further improvement.

Within school we regularly conduct peer review sessions whereby we critically look at Maths as a subject within the school. We observe lessons, speak to children/staff, analyse books/marking and ultimately come together as a staff to critique what we are doing well and what we want to improve. In recent times we have identified a need to improve reasoning and problem-solving opportunities throughout school and have improved our resources within school to tackle this.

Book Looks:
Book Looks will take place each half term to evaluate standards and the quality of work produced in mathematics throughout the school as well as to enable the Maths leader to support teachers. See timetable for key dates.

Surveys:
Annually, a staff, student and parent survey will be sent out for all stake holders to feedback on their experiences of Maths at Streatham and Clapham. This gives the Maths lead key information to help support the improvement of Maths in the school.

Review:
This policy will be reviewed annually.
Last reviewed August 2023.
Next review July 2024

Risk Assessment

- provides a safe and healthy working/teaching/learning environment in compliance with, or improving upon, statutory requirements
- provides safe systems of working to ensure, as far as is reasonably practicable, the health and safety at work of all staff/pupils
- provides safe equipment
- carries out detailed reporting and investigation of all accidents and dangerous occurrences to persons and/or property to prevent recurrence
- provides safe storage for dangerous materials.
- trains pupils in the correct use of mathematical apparatus, particularly those that can cause personal injury.