Westgate Primary School
Mathematics Policy

Rationale

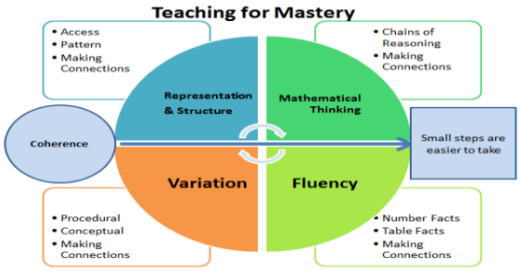
At Westgate Primary School, we believe mathematics is an important part of children's development throughout school: mathematics teaches us how to make sense of the world around us through a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. We believe that this is underpinned by effective quality first teaching and a balanced, motivating curriculum.

Our Aims (INTENT):
We intend on delivering a curriculum which:

- Allows children to be a part of creative and engaging lessons that will give them a range of opportunities to EXPLORE mathematics following a mastery curriculum approach.
- Gives each pupil a chance to BELIEVE in themselves as mathematicians and develop the power of resilience and perseverance when faced with mathematical challenges.
- Recognises that mathematics underpins much of our daily lives and therefore is of paramount importance in order that children ASPIRE and become successful in the next stages of their learning.
- Engages all children and entitles them to the same quality of teaching and learning opportunities, striving to ACHIEVE their potential.
- Develops children's FLUENCY 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;
- Promotes REASONING mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language;
- SOLVES 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;
- Promotes ENJOYMENT and enthusiasm for learning through practical activity, exploration and discussion;

Key Principles

The content and principles underpinning the mathematics curriculum reflect those found in high performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. These principles of teaching for mastery are also underpinned by the NCETM's 5 big ideas.



The principles and features that characterise this 'mastery' approach are:

- It is **achievable for all**: We have high expectations and encourage a positive 'can do' mindset towards mathematics in all pupils, creating learning experiences which develop children's resilience in the face of a challenge and carefully scaffolding learning so everyone can make progress.
- **Coherence**: Coherence is achieved through the planning of small, connected steps to link every question and lesson within a topic. This ensures deep and sustainable learning and ensures learning is not superficial. Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge. The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention. Challenge is through greater depth rather than accelerated content, (moving onto next year's concepts) teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.
- **Mathematical thinking**: The ability to reason about a concept and make connections – pupils are encouraged to make connections and spot patterns between different concepts (E.g. the link between ratio, division and fractions) and use precise mathematical language, which frees up working memory and deepens conceptual understanding. Problem solving is central – this develops pupils' understanding of why something works so that they truly have an appreciation of what they are doing rather than just learning to repeat routines without grasping what is happening.
- **Conceptual and procedural fluency**: Teachers move mathematics from one context to another (using objects, pictorial representations, equations and word problems). There are high expectations for pupils to learn times tables, key number facts (so they are automatic) and have a true sense of number.
- **Conceptual and procedural variation**: Teaching with variation is to highlight the essential features of the concepts through varying the non-essential features. Conceptual variation is using different representations of the same idea to strengthen understanding of what 'it' is. Procedural variation is choosing to vary one aspect to expose a mathematical structure or connection. Teachers use both procedural and conceptual Variation within their lessons. Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up. Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.
- **Representation and structure**: A focus on Representation and Structure ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns and generalise whilst problem solving.

IMPLEMENTATION

Planning

At Westgate we follow the principles set out in the National Curriculum Framework of study 2014 and the Statutory Framework for the Early Years Foundation Stage.

- Maths is taught on a daily basis from Year Reception- Y6;
- Teachers use a variety of teaching methods to deliver the curriculum to achieve end of year national expectations;
- Teaching and learning takes place largely within a whole class setting;
- Same day intervention is used to help children if they need to 'catch up'.
- CPA (Concrete, Pictorial, Abstract) representations are chosen carefully to help build procedural and conceptual knowledge together.
- The long term curriculum maps allow Maths topics to be taught for longer so children have time to practice and consolidate. There are revision weeks allocated to revisit topics too.
- Medium term plans break down the learning into smaller steps and refer to the maths no problem textbooks. 'Maths No Problem!' Textbooks are used from Y1-6. Year 1-4 also use the MNP workbooks.
- Short term planning is done through Smart Notebook resources.
- In Foundation stage, the emphasis is on teaching Maths through stories and books with strong topic links, child initiated learning through play, with some adult intervention, demonstration and use of the language. In foundation, the mastery approach allows children to gain a secure understanding of number.

Mathematics Journals

A maths journal is used to record maths work and thinking. It is a good tool to help children to articulate their ideas. For example, to record the solutions to maths problems, along with the strategy and thought processes used to arrive at the solution. For example, children may be asked to reflect on their maths learning or be asked to write about, "what you already know about..." or "what you did today and do you have any questions?", or "the three most important things you learned in this unit." The journal provides children with the opportunities to reflect on strategies and assess their own learning. It is also useful as an assessment tool to gain an insight into children's abilities, opinions, understandings, and misconceptions. It creates a documented portfolio of student growth and progress.

Pupil Support And Differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems which deepen their knowledge of the same content. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with same day intervention. This may take place alongside the teacher within the classroom or through targeted sessions in a smaller group setting or through interventions such as 1stClass@Number, Success@Arithmetic or Power of 2 etc. Teachers also use the 'Mastery Assessment' materials tasks, questions and activities to teach the same curriculum content to the whole class, challenging the rapid graspers by supporting them to go deeper rather than accelerating some pupils into new content.

Curriculum content and curriculum design

A detailed, structured curriculum is mapped out across all year groups, ensuring continuity and supporting transition. Objectives are in relatively small carefully sequenced steps, which must each be mastered before pupils move to the next stage. Fundamental skills and knowledge are secured

first. This often entails focusing on curriculum content in considerable depth at early stages. We base our maths lesson on the 'Maths No Problem' resources from Y1-6.

An Example of a Maths No Problem Lesson

Pupils start the lesson with an 'In Focus' problem, which they discuss in partners. This is a problem solving activity, which prompts discussion and reasoning. These problems are often presented with objects (concrete manipulatives) for children to use as it is important that children move through the concrete, pictorial, abstract representations. Teachers also use careful questions to draw out pupils' discussions and their reasoning. The class teacher then leads pupils through strategies for solving the problem, including those already discussed. At this part of the lesson, the children might need to write down their strategy in their 'Maths Journal'. The class then try some questions in 'Guided Practice'. Carefully designed variation in these questions builds fluency and deep understanding. When they are ready to apply their learning independently, the children answer questions in their journal and workbooks. If some children are not ready by this point, they will continue 'Guided Practice' with the teacher in a small group or TA. As the children complete their independent tasks, teachers will give immediate feedback though marking as they go along or through peer marking. This is an effective way to quickly identify misconceptions and close the gap.

Resources

A range of high quality curriculum materials are used to support classroom teaching. Concrete and pictorial representations of mathematics are chosen carefully to help build procedural and conceptual knowledge together. Exercises are structured with great care to build deep conceptual knowledge alongside developing procedural fluency. The focus is on the development of deep structural knowledge and the ability to make connections. Making connections in mathematics deepens knowledge of concepts and procedures, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques. Westgate Primary also uses 'Maths No Problem' text books which provide a highly scaffolded learning framework with problem solving at its core. The programme encourages extensive practice to develop fluency and mastery, so that every child, across all abilities, can succeed in mathematics. The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into our learning and teaching. Teachers' resources are largely based on the 'Maths - No Problem!' series, which can be accessed online. Every teacher has an account and also has access to the Academy Video Training.

Times Table Rock Stars

At Westgate we ensure that the children have plenty of opportunities to develop their quick recall of key number bonds, facts and times tables, as this helps the children to become more confident when solving problems and calculations.

Westgate has signed up for Time Tables Rockstars to help support the children in learning, practising and consolidating their recall of multiplication and division facts.

TT Rock Stars is a carefully sequenced programme of times tables practice. Teachers choose appropriate times tables for their class and the tests are carried out daily. Each test is a 3 min 'quiz' on times tables whilst sometimes listening to rock music. The idea is to complete all 60 questions in less than 3 minutes. At the end of each week the scores and times are added up and entered onto the Times Table Rockstar data sheet to give each child their Rock Status. Our aim is to improve confidence and speed in times tables to help them with more complex maths skills. In Year 1, the children complete similar daily quizzes but with a focus on number bonds and addition and subtraction facts. We also use Numbots which is a similar programme but focuses on number bonds and facts. Teachers also set online homework using Numbots and TTRockstars each week.

Maths Non-Negotiables
Each class from Year 1 to Y6 has a set of Maths Non-Negotiables. These are generally the essential elements and 'basics' of Maths that are crucial for children's mathematical learning and progression. Of course, all areas of Maths are important and valuable but a focus on the 'basics' can help to advance and secure their learning across this subject. These maths non-negotiable form the basis for our weekly homework from Y1-6. (See Maths Non-negotiable list in each year group)

IMPACT
Assessment

- Progress in mathematics will be monitored through ongoing teacher assessments and Children's work in maths is marked in accordance with the school's Marking and Feedback Policy.
- Teachers use the mathematics objective assessment grids to assess the children throughout the year.
- Teachers use the 'Mastery Assessment' materials for tasks, questions and activities to teach the same curriculum content to the whole class, but gives a range of questions that will also challenge the 'rapid graspers' by supporting them to go deeper rather than accelerating some pupils into new content.
- Progress in times tables is monitored using the TT Rock Star challenges.
- All the children have Mathematics targets which are based on the Maths non-negotiables.
- In Nursery and Reception children are assessed against the Development Matters statements and the ELGs for number, shape, space and measures that form part of the Foundation Stage Profile;
- Progress in mathematics is monitored using our termly Pupil Progress Meetings and kept on the VLE for staff to access. Children's books form the main evidence base for progress and are monitored by termly 'Book Looks' conducted by SLT. Feedback is given both at individual and whole school level;
- Y2 and Y6 undertake statutory SATs for arithmetic and reasoning at the end of the year. Reports indicate to parents where their achievement sits in relation to the expected standard;
- Children in Years 3, 4 and 5 use the Testbase optional SATs in summer term to highlight progress made and areas of concern for the following year;

Inclusion, SEN & Equal Opportunities
Mathematics lessons, tasks and materials can be differentiated by the class teacher to meet the needs of individual children. Children identified as having Special Educational Needs may need differentiation and support of materials and tasks consistent with that child's Learning Passport;
A number of intervention strategies are used to develop children's specific learning needs in Mathematics. These include Plus 1, and Power of 2. These often run for a term and then impact is assessed using entry and exit data.

Adult support is offered to children with SEN regularly but is not used exclusively in every lesson so children do not become over-reliant on adult support. All children will be given opportunities to participate on equal terms in all maths activities and due consideration will be given to the principles of Inclusion. Same day intervention is used to prevent gaps in attainment opening up wherever possible.

(See also our Special Educational Needs Policy)

Role of subject leader: Monitoring and evaluation
Monitoring of Standards of children's work and the quality of teaching in mathematics is the responsibility of the mathematics subject leader at Westgate. This involves book sampling, pupil

interviews, target setting, analysing assessment grids and Sats papers, and informal discussion with colleagues. The work of the subject leader also involves supporting colleagues with the teaching, planning, informing staff about current developments in the subject and providing a strategic lead and direction for the subject in the school. TRG- Maths Teacher Research Groups are used to support staff with maths teaching and is an effective collaborative approach which evaluates and develops good practice.

Policy Review
This policy was agreed by staff and approved by Governors in January 2021. It will be reviewed in 2024 and thereafter on a three year cycle.

Signed: **(headteacher)**

Date:

Signed: **(chair of governors/ sub-committee)**

Date: