WINGROVE PRIMARY SCHOOL

Policy and Guidance for Mathematics

"The only way to learn mathematics is to do mathematics."
Paul Halmos

Intent
At Wingrove, we recognise that mathematics is essential in everyday life and, with this in mind, we ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them throughout their lives. We strive to provide children with opportunities to investigate, reason and problem solve in fun and meaningful contexts.

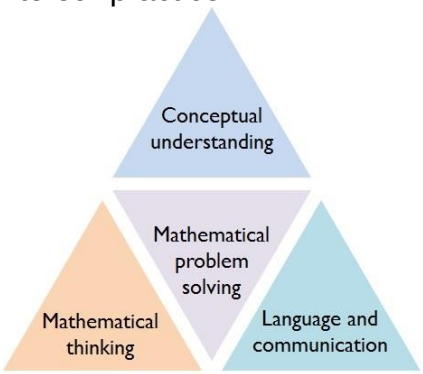
National Curriculum
The national curriculum for mathematics aims to ensure that all pupils:

- 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

Our Aims
In addition to the above, mathematics teaching at Wingrove aims to develop:

- a growth mindset about ability to learn mathematics
- a positive attitude towards mathematics and an awareness of how fascinating elements of mathematics can be
- competence and confidence with numbers and the number system and other mathematical knowledge, concepts and skills
- problem solvers, who can reason, think logically, work systematically and apply their knowledge of mathematics
- an ability to communicate using mathematical language
- an ability to work both independently and with others

Implementation
We adhere to the statutory guidance set out in the EYFS Framework and the 2014 National Curriculum.
Additionally, we teach for masteryof mathematics and have embedded aspects of the Singapore approach into our practice.



This approach has mathematical problem solving at its heart and has three key principles. We teach children to:

1. use spoken and written language with confidence and clarity to explain and justify mathematical reasoning
2. have a deep conceptual understanding of mathematical concepts
3. develop mathematical thinking, including generalising, classifying and comparing, and modifying.

To support teachers with devising a teaching for mastery programme for their year group we use the following documents in KS1 and KS2:

- White Rose Mathematics Hub scheme of work
- Mathematics No Problem textbooks
- Big Mathematics CLIC
- NCETM Teaching for Mastery Questions, Tasks and Activities

Teaching and Learning
The Singapore Mathematics approach to teaching ensures all concepts are taught using a **concrete-pictorial-abstract** pedagogy. Allowing children to feel and see concepts before moving into abstract form provides every child with access to the mathematical focus. Our calculation policy sets out further guidance for CPA in number and calculation.

This approach also adopts the **bar model** which enables children to solve problems systematically through visual representation.

Fundamental to this approach is the need to develop children's **language** and vocabulary. "What children can not explain; they can not use" (Yeap Ban Har). It is absolutely essential that within every lesson children are given opportunities to explain their mathematics. Children are encouraged to answer in full sentences, and teachers insist that children mirror the language they hear adults using. Adults should mirror back alternative words for the same meaning to enrich our children's range of vocabulary, for example if a child says '3 times 5 is 15,' the

teacher might respond with, ‘Yes, the product of 3 and 5 is 15’ or ‘3 multiplied by 5 equals 15.’

Children need varied and frequent practice in order to be fluent. If children are not fluent, then when they are solving more complex problems the working memory is taken up by calculating basic facts, and children have less working memory to focus on solving the actual problem. To this end, our children have **additional basic skills sessions** in KS1 and KS2 outside of the mathematics lesson. We use Big Maths ‘CLIC’ to plan for this as it has a sequential progression for teaching addition, subtraction, multiplication and division facts which complements the skills needed to achieve end of year expectations.

Daily lesson structure

Within KS1 and KS2, our mathematics lessons adopt a structure of:

1. Anchor (hook – opportunity for exploration)
2. Guided practice (dialogue between pupils and teacher where teacher models examples)
3. Independent practice (students have the opportunity to practice examples themselves independently)
4. Reflection (opportunity to review learning and misconceptions – plenaries, mini-plenaries)

Within the Singapore approach, research from key theorists in education is heavily referred to in promoting positive attributes to learning. The following are fundamental in ensuring that such key aspects are being delivered:

- Opportunities for children to interact with their peers
- Concrete activities
- Exploration
- Safety of learning environment (promoting ‘productive failure’ – learning form mistakes)

Evidence of these can be seen in all mathematics classrooms right across Wingrove.

Impact

Teachers assess children’s progress informally and daily through questioning, observation and interaction. Children’s recordings are used as an evidence base which may include work in books, photographs in practical maths books, and video evidence via Seesaw, Class Dojo (KS1 & 2) or Tapestry (EYFS). Ongoing target setting is linked to curriculum expectations and targets are set out in the front of books (in KS1 & 2). Formal assessments are carried out termly. Teachers use formal assessments, targets and daily assessment for learning to inform their judgements on attainment which are recorded on school trackers. Concerns regarding slower rates of progress or underachievement of individual children are discussed with senior leaders termly during pupil progress meetings.

Resources

All teachers have access to a variety of materials which support our CPA pedagogy including, but not limited to, Numicon, Cuisenaire, Base-10, place

value counters, multilink and tens frames. Resources are used in daily practice across the school.

How should mathematics engage with the wider curriculum?
Throughout the curriculum, opportunities exist to extend and promote mathematics. Teachers take advantage of these opportunities and evidence can be found in creative curriculum planning and children's creative curriculum books.

Special needs
Wherever possible, children with SEN are taught within the daily mathematics lesson. Occasionally, children may be withdrawn for intervention depending on individual need and the best interests of the learner.

Differentiation
Within mathematics, a child may excel with one concept but find another more difficult, therefore groupings are fluid and flexible. With the mastery approach, children who are quick graspers within a particular area will be challenged by the teachers carefully designed activities. Differentiation may be achieved in various ways, including:

- open ended questioning and activities which allow more able children to offer more sophisticated mathematical responses
- low threshold/high ceiling activities which can be accessed and taken to different points providing support and challenge for all
- recording e.g. allowing some children to give verbal responses and photographing their learning
- providing concrete and/or pictorial support
- offering intelligent practice through procedural variation and conceptual variation

Equal opportunities
All children should have equal access to the curriculum. Our mastery approach to mathematics is designed to meet the needs of *all* learners irrespective of any particular circumstances.

Homework
Short, weekly homework tasks are given in KS1 and KS2 as set out in the Homework Policy. All children have access to My Maths and this may be used as, or in addition to, weekly homework.

Reporting
All parents are given the opportunity to discuss their child's progress at each of three parents' evenings. They also receive an annual report which includes a summary of their child's progress in mathematics.

Subject Leaders: Lauren Hopper & Ben Henderson
Date formulated: May 2002
Updated: December 2019