

# Whitby Heath Primary School



## Mathematics Policy

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<b>Chair of Governors</b>	Mr N Lacey

At Whitby Heath, the teaching of Mathematics is highly prioritised. Within the Foundation Stage, it is guided by the requirements and recommendations set out in the Early Years handbook and Development Matters. All children have the opportunity to develop their understanding of mathematics through child initiated and adult led sessions. Maths is used as part of the daily routine, the continuous provision, stories and songs and rhymes. Staff use observation and to inform the child's next steps within number and numerical pattern. By the end of the foundation stage, our children will be expected to achieve the Early Learning Goals.

Across the school, Maths is taught daily. Alongside this, once a week, start of day activities (SODA) are used for the spaced retrieval of key information which informs assessment. As well as weekly, monthly and termly retrieval quizzes. Additional opportunities (such as World Maths Day) are planned throughout the year for enrichment of our curriculum. Within the curriculum, the key knowledge and skills for each year group can be seen in the Power Maths (KS1 and KS2) progression maps and Mastering Number (EYFS) progression overview. These have then been broken down into units in our long and medium term planning, which class teachers then use to plan progressive and engaging lessons. Our medium-term planning ensures each session follows a sequence of learning that encourages our children to engage, explore, explain, elaborate and evaluate.

The teaching sequence in mathematics ensures that children move between concrete representations, pictorial representations and then moving to the abstract. To do this, all lessons start with a 'Discover' task where a practical (concrete) problem is discussed, moving from this practical question to visual representations and finally to the abstract working out of the problems. Challenge questions within lessons allow children to take responsibility within their learning and move through this learning at their own rate moving from the overlearning of varied fluency tasks to the practical application of Maths through open-ended problem-solving tasks as well as developing their reasoning skills throughout lessons.

We aim to develop a Teaching for Mastery approach based on the NCETM's 5 Big Ideas. A Mastery approach means Maths teaching and learning at Whitby Heath ensures:

- Lessons are achievable for all
- Deep and sustainable learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
- Conceptual and procedural fluency
- Intelligent practice
- The belief that all pupils can achieve
- Keeping the class working together so that all can access and master mathematics
- Development of deep mathematical understanding
- Development of both factual/procedural and conceptual fluency
- Longer time on key topics, providing time to go deeper and embed learning

## 1. **Language development**

Within Maths, oracy opportunities are planned into the curriculum that allow children to develop the physical, linguistic, cognitive and social and emotional aspects of learning. Opportunities are planned that allow children to present, explain and discuss key aspects of their learning and to challenge each other in their views. Group and paired work is used daily, particularly in the 'Discover', 'Share' and 'Think Together' parts of the lesson in KS1 and 2 and in continuous provision in EYFS.

Development of vocabulary in Maths is vital in our children closing the vocabulary gap to their peers. Vocabulary is explicitly planned, taught and assessed, ensuring a thorough grasp of new language. Working Walls within all classrooms are added to progressively from lesson to lesson in topics with key vocabulary. These can then be referred back to in the next lesson to promote sticky learning and to scaffold all children in retaining key language and information. The learnt vocabulary is assessed throughout each unit taught where children have to demonstrate the use of the words in context during lessons or through application in their quizzes or tests.

## 2. **Knowledge**

Our Maths curriculum is planned and sequenced so that new knowledge and skills build on what has been taught before. We recognise that new learning is fragile, so our approach is generative and sticky, enabling our pupils to make links between new and existing knowledge to aid long-term retention. Learning is sequenced to ensure that there are opportunities for spaced learning and links between curriculum areas are explicit allowing children to build a detailed schema for across different disciplines in Maths and also across other subjects.

At Whitby Heath, we follow the Power Maths Planning sequence, however, this is adapted, as necessary, to meet the needs of our pupils i.e. spending longer on certain concepts to ensure that the children fully understand what has been taught before moving on.

Development of both disciplinary and substantive knowledge is well sequenced to ensure that children know and remember more. Both of these types of knowledge are sequenced within the Power Maths progression documents.

New knowledge is taught through direct instruction and modelled by the teacher. Children are given time to use independent practice and spaced repetition to further secure new knowledge. The curriculum is organised to enable children to build webs of knowledge (schemas), with explicit links being drawn between new and existing knowledge. These links are highlighted within medium term plans of other subjects to ensure that staff explicitly make these links when planning lessons.

When knowledge is secure and links have been made, children are encouraged to take this knowledge deeper and apply this critically in different situations. All children are encouraged to access open ended assessment tasks that allow children to take learning deeper and to demonstrate their critical thinking skills.

SODA sessions and low stakes quizzes are used weekly/monthly/termly to ensure that knowledge is recalled and retained. These form part of our assessment for learning in Maths allowing us to revisit knowledge that isn't secure.

### 3. **Skills**

While the teaching of disciplinary knowledge is key to progress in subjects, children require the opportunity to turn this knowledge to practice and apply skills. Our Curriculum planning ensures that these opportunities are embedded for all children. Varied fluency activities are used to ensure that skills are overlearned before the children have opportunities to apply these to wider concepts.

Children are encouraged to ask their own questions about what they observe and make some decisions about which types of mathematical enquiry are likely to be the best ways of answering problems and solving problems through strategies taught. They should draw simple conclusions and use some mathematical language, first, to talk about and, later, to write about what they have found out. Pupils should draw conclusions based on their data and observations, using evidence to justify their ideas, and using their mathematical knowledge and understanding to explain their findings.

### 4. **Attitudes and values**

In order to develop the children's growth mindset, rather than simply praising success, we praise effort and persistence. We believe learning should be a challenge and within mathematics, our children are encouraged to take risks and to make learn from their errors. Our approach to our curriculum aims to build a growth mindset, a respect for self and others, kindness and resilience, with staff modelling across the curriculum how to deal with challenge and adversity. We want our children to take risks and attempt challenges they find tricky.

We want our children to see themselves as mathematicians and develop self-efficacy and intrinsic motivation in Maths. Successes are shared daily at the start of every lessons so they can learn from their own and other's achievements. From EYFS through to KS2, we give the children opportunities to be mathematicians in real life contexts and to celebrate the successes of their discoveries.

### 5. **Developing a love of mathematics**

Enrichment activities for different year groups ensure that the children meet and discuss the roles of mathematicians across society. Children often find joy in their discoveries in Maths. Giving them opportunities to ask questions and explore their findings is key to this. Additional enrichment opportunities are provided for World Maths Day.

### **Assessment:**

NFER assessments are used twice a year in Years 1-5 (past SATs papers are used in Year 6) as a summative assessment of the mathematics learnt. Question level analysis is used for key groups to ensure that we are providing additional opportunities for children to revisit areas that aren't secure.

Formative assessment is an integral part of daily lessons and is first and foremost the essence of helping making our pupils make instant progress in their mathematical knowledge and in their skills. This is done through a mixture of high-level questioning, discussion, oracy activities and written work.

We use live marking and feedback to enable teachers to target next steps for pupils effectively. Opportunities for children to review and improve their learning are embedded into each lesson. Children are given the opportunity to evaluate their

own work, and that of their peers. During and on completion of a piece of work, the teacher responds, identifying areas for development, following our whole school feedback policy. Children's work is valued, celebrated and displayed around the class and school; including in weekly Celebration Assemblies.

We also ensure children are well prepared for the Multiplication Tables Check (MTC) in Year 4 by completing our Times Table Challenge twice-weekly in Years 2-6. Once children have completed the MTC in Year 4, they continue to embed their times table knowledge into Years 5 and 6 through the twice-weekly challenge.

In each year group (Years 2-6) children have a target to complete the required times tables National Curriculum statutory objectives for their year group. The challenge is split across 6 levels linking to the National Curriculum expectations.

**The times table levels are as follows:**

Iron Award (School expectation by end of Spring term Year 2):

- Iron Level 1: 2 times table
- Iron Level 2: 10 times table
- Iron Level 3: 5 times table

Bronze Award (National Curriculum expectation by the end of Year 2):

- Bronze Level 1: 2, 5 and 10 times tables
- Bronze Level 2: 2, 5 and 10 divisions

Silver Award (National Curriculum expectation by the end of Year 3):

- Silver Level 1: 3, 4 and 8 times tables
- Silver Level 2: 3, 4 and 8 divisions

Gold Award (National Curriculum expectation by the end of Year 4):

- Gold Level 1: 6, 7, 9, 11 and 12 times tables
- Gold Level 2: 6, 7, 9, 11 and 12 divisions

Platinum Award (School expectation by the end of Year 5):

- Platinum Level 1: All tables (12 x 12) times tables
- Platinum Level 2: All tables (12 x 12) divisions

Diamond Award (School expectation by the end of Year 6):

- Diamond Level 1: A range of multiplication questions using a variation of decimals and whole numbers
- Diamond Level 2: A range of division questions using a variation of decimals and whole numbers

If a child completes the required times tables set out in the National Curriculum/school's expectations, they will then move onto Minute Maths. The children will be given a range of arithmetic questions which they must complete in 1 minute. The children must achieve a score of at least 80% in their Minute Maths questions, on 3 separate tries, to move onto the next level. This enables them to further embed their fluency of a range of core Maths strands (number and place value, addition and subtraction, multiplication and division, fractions, percentages and decimals).

At the end of each year, a written report is given to parents that show whether a child is achieving the required standard (age related expectations). Maths targets

are also discussed with parents and strategies to move learning forward are discussed.

If a child is working below, specific areas are fed back to parents to support learning and also highlighted in the assessments so that future teachers know what areas need more work to ensure a solid foundation to new learning.

Tracking of key groups, but particularly target children, allows for a better structure to learning. Regular sessions of a Maths intervention called Number Stacks enable the children to fill gaps in their knowledge and understanding and make progress towards meeting age related expectations.

### **SEND and Inclusion**

At Whitby Heath we have high expectations of all our pupils. However, we recognise that for some pupils, additional support is needed to ensure they can access tasks and so that they can retain key learning. Tasks are adapted or scaffolded in such a way so as to ensure that they are provide suitable challenges that focus on the mathematical learning and remove any barriers for learning that stop learning in mathematics. Teachers use their SEND profiles and appropriate assessments to help inform their planning. This way, a person-centered approach ensures progress is made and makes their learning a personalised experience.

At Whitby Heath, we want all learning to support independence wherever possible. Teachers will plan lessons so that pupils with SEND are able to successfully access the key content of the Maths curriculum and ensure that no ceiling is placed on their learning and what they can achieve. Promoting independence, we allow the children to feel a sense of equality and belonging in their classroom environment. Where appropriate, the following strategies could be used for pupils with SEND:

#### Task Adaptation

- Opportunities for overlearning key knowledge.
- Technology used for recording information. Video recording of work if writing is an issue/use of speechnotes programme or Clicker 7/a scribe/dictation tool on iPad.
- Web based learning for practice and learning of key knowledge.
- Use of concrete resources
- Voice recordings of step by step instructions
- Voice recordings of responses.
- Screen shots and photographs
- Voice recordings

#### Scaffolding

- Modeling of work specifically for a small group of children
- Vocab mats highlighting specific vocabulary for a task
- Broken down instructions for a task
- Sentence stems from board/questions
- Task organiser
- Use of concrete resources
- Further questioning
- Additional focused explanations
- Precision teaching of key knowledge
- Additional oracy opportunities
- Peer support
- Timestable Grids

Additional strategies for pupils will be highlighted as a part of the SEND strategy meetings and in consultation with other professionals. These form part of a child's SEND profile and support teachers in removing barriers for learning.

Where a child struggles with key aspects of learning, it is crucial that we highlight what is key knowledge for a child to move on with their learning. Progression maps highlight which knowledge is the basis for other knowledge later on within the Maths curriculum. Staff therefore provide time for overlearning of this key knowledge where it is deemed appropriate for these children. Support and CPD is given to staff to ensure they have a good understanding of what learning is key to move on. These children are discussed regularly with the SENCo.

Interventions are planned for children who are struggling with specific aspects of the Maths curriculum. Precision teaching, Number Stacks and other interventions ensure that gaps in learning are filled.

### **Higher Attainers**

Opportunities for higher attainers to take learning deeper are planned throughout the curriculum. Open ended tasks and high quality first teaching ensure that learning is taken deeper. Enrichment opportunities are planned throughout the year.

Opportunities for children to explore careers in STEM are planned into the curriculum and accessed where appropriate. Visiting speakers, particularly those from similar backgrounds to our pupils, are encouraged to come in and support classes in delivering key areas of Maths.

### **CPD for staff**

CPD is planned for staff throughout the year and opportunities are planned into our yearly training in line with our school development plan. Work alongside the Cheshire and Wirral Maths Hub forms the basis of our CPD programme for all teaching staff (inclusive of TAs). Staff are encouraged to also complete their own research. Coaching happens continuously throughout the year within the school. The Maths subject leaders also offers support to staff through planning meetings and co-teaching throughout the year. Further support is planned for teachers where needed.

### **Monitoring of Maths**

The development cycle is set out by the senior leadership team at the beginning of each academic year. Monitoring includes book looks, lesson visits, learning walks and pupil/staff voice surveys. All monitoring undertaken serves to improve our practice, with the aim of bettering the outcomes for our pupils.

### **Transition to KS3**

At Whitby Heath, we work closely with our feeder secondary schools to ensure a quality of provision that gives our pupils firm foundations for Year 6 and beyond. Pupils in Year 5 and 6 regularly access Maths transition lessons at the high school that allow them to demonstrate the knowledge that they have learnt and to ensure that learning in KS3 successfully builds on the foundations laid at KS2.

### **EYFS**

Mathematics within the Foundation Stage is guided by the requirements and recommendations set out in the Early Years handbook and Development Matters.

All children have the opportunity to develop their understanding of mathematics through child initiated and adult led sessions. Mastering Number and Power Maths are used as the main schemes which teachers use to plan from.

Maths is used as part of the daily routine, the continuous provision, stories and songs and rhymes. Staff use observation and to inform the child's next steps within number and numerical pattern.

By the end of the foundation stage our children will be expected to achieve the Early Learning Goals by demonstrating an understanding of:

- Deep understanding of numbers to 10
- Subitise to 5
- Recall number bonds to 5 and some to 10
- Doubling facts
- Verbally count to 20
- Recognise patterns in the counting system
- Compare quantities to up 10
- Recognise more, less the same
- Represent patterns within number including odd and even numbers
- Sharing amounts equally

Although Shape, Space and Measure has been excluded from the new framework we still provide opportunities and teach:

- The names of shapes
- Opportunities to explore how to create images and 3d models using shape
- Use and explore vocabulary linked to position, size, measure and shape.

### **Impact**

At Whitby Heath, we ensure that all students are exposed to rich learning experiences that:

- Enable all students to make good progress in their mathematical knowledge, skills and vocabulary from whatever the students starting point may have been. We define good progress as knowing more and remembering more. It is the widening of knowledge, skills, understanding and behaviours.
- Our children have the basic skills that allow them to achieve and flourish.
- Children have self-efficacy and see themselves as mathematicians.
- We aim to inspire our children to become the next generation of mathematicians, engineers and environmentalists who love, look after and respect themselves, their communities and the world around them.
- Our pupils experience a language rich mathematical experience which enables them to apply their knowledge as articulate citizens of the future discussing research, knowledge and developments.
- for our pupils to be resilient when exploring concepts and learning new mathematical information.
  - for pupils leaving us to be well prepared for the next stage in their lives, particularly for the further study of Maths at KS3.
  - for pupils to apply their knowledge in their own lives to enable them to have a good level of physical and mental well-being.