



Blue Gate Fields Junior School

Maths policy

Policy details:

Date of policy:	September 2022
Last updated:	September 2022, reviewed September 2023
Date of next review:	September 2024

Person (s) responsible for implementation and monitoring:

Charlotte Charlesworth and Alice Hewlett

Sian Acreman (Head Teacher)

Signature (Chair of governors)

A handwritten signature in black ink, appearing to read "Karen Oakley".

Signature (Head teacher)

A handwritten signature in black ink that reads "S E Acreman".

Date:

The National Curriculum states that:

“A high-quality mathematics education...provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.”

At Blue Gate Fields Junior School, our overarching vision is for our pupils to be equipped with the skills, knowledge and language to successfully meet the demands of the curriculum, whilst enjoying the learning and recognising the relevance and usefulness of mathematics in the wider world. By providing our children a bespoke curriculum that prioritises them gaining a deep and conceptual understanding of mathematics, we will support their ability to reason, problem solve and tackle challenge. We want to inspire our children and promote mathematical curiosity that will equip them with the life skills needed to grasp future opportunities.

Our aims:

- To deliver a bespoke, distinctive **small step**, strategy focused curriculum to embed concepts and allow children to hold onto their learning.
- To support children in developing a **deeper conceptual understanding** of maths so that they can solve complex problems in unfamiliar contexts and be flexible with skills and knowledge.
- To provide all children with the **vocabulary and language** needed to reason with mathematics and articulate their thoughts and ideas.
- To encourage children’s **independence** by creating a safe and stimulating learning environment where mistakes are valued.
- To support children in developing their **growth mindsets** so that they have the confidence to persevere and grapple when seeking solutions to challenging problems.
- To inspire and promote mathematical **curiosity** and a love for learning.
- To develop a **reasoning based curriculum**, rather than a calculating curriculum, which leads to reasoning mindsets rather than calculating mindsets in our children.
- To enhance the cultural capital of our pupils.
- To deliver teaching which is underpinned by **sound educational research**, in order to offer the best and most current thinking.

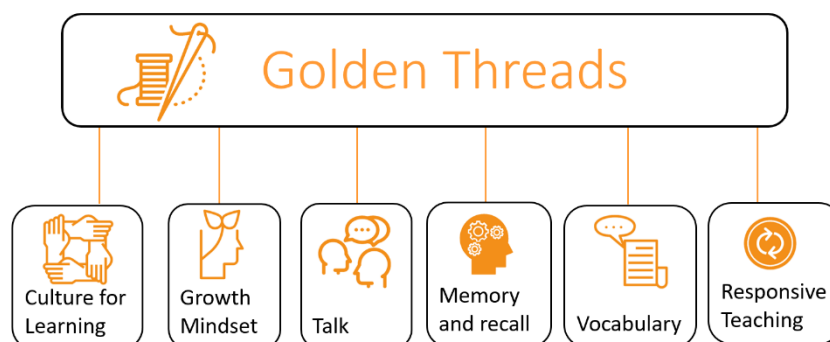
Teaching and Learning:

At Blue Gate Fields Junior School, we have high expectations of success (driven by growth mindsets), ensure that learning is built upon solid foundations and keep high-quality talk central to our pedagogy. Our curriculum is a mastery curriculum. Helen Drury’s definition of mastery underpins our pedagogy:

“A mathematical concept or skill has been mastered when, through exploration, clarification, practice and application over time, a person can represent it in multiple ways, has the mathematical language to be able to communicate related ideas, and can think mathematically with the concept so that they can independently apply it to a totally new problem in an unfamiliar situation.”

The Golden Threads:

The Golden Threads are central to the teaching and learning of maths and contribute to the distinctive Blue Gate Fields Junior School approach. We value these teaching and learning principles, as they are the key principles that best meet the needs of our specific learners, who disadvantaged or not, face a combination of linguistic, social or economic barriers to learning. (See *Teaching and Learning policy for more information.*)

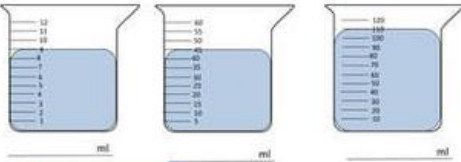


A variety of teaching and learning strategies are used in our maths lessons:

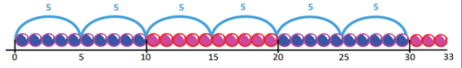
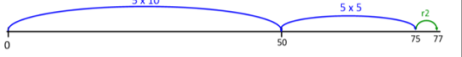
- Throughout the learning process, and particularly when new material is introduced, explicit links are made to the last point of learning to support the children's ability to recall and build on prior knowledge.
- Teaching is delivered in **small steps**, through guided practice with opportunities that scaffold learning, to give the children the skills and confidence to work independently. **Modelling** is a central feature of all maths lessons, with teachers using a 'think aloud' approach to model each stage and secure pupils' understanding of the learning. The modelling is direct, instructional and free from distraction.
- **Responsive teaching strategies**, such as the use of mini whiteboards and carefully planned questioning, mean that children get regular opportunities to rehearse new learning and the small steps leading up to it, whilst teachers are able to gather information in order to assess pupil understanding in the lesson.
- **Feedback** happens in the moment. Constant assessment of learning through questioning, monitoring of pupil talk and mini-plenaries equips teachers to respond immediately to children's needs. This ensures children can receive the appropriate level of support and challenge in the moment.
- **Concrete Pictorial Abstract (CPA)** is a fundamental approach used in all teaching across KS2 to support children's understanding of abstract topics and to clarify misconceptions. Children are encouraged to represent problems and concepts in multiple ways using concrete resources and pictorial representations such as bar models.
- **Partner talk** is central to every lesson to enable children to discuss, clarify, piece together knowledge, tinker with ideas and explain their thinking. Talk partners are changed weekly and are selected at random, in line with Shirley Clarke's research on effective talk partners. Talk underpins all written work. We believe that if a pupil can articulate thinking verbally, then they will be able to expand, deepen and develop learning.

- To address the knowledge and linguistic gap of our pupils and to ensure talk in the classroom is of high quality, we focus on the teaching of precise **vocabulary** choice that is accurately used. Teachers carefully select and explicitly teach and model the correct use of **mathematical language**.
- **Learning intentions** are shared at the beginning of every lesson and referred to throughout. They contain the language the children will encounter during the lesson, useful memory links and sentence frames, where appropriate.

I am learning to measure volume.

LANGUAGE	MEMORY LINKS
<ul style="list-style-type: none"> ● <i>measure</i> ● <i>volume</i> ● <i>capacity</i> ● <i>scales</i> ● <i>interval</i> ● <i>millilitres (ml)</i> ● <i>litres (l)</i> 	<ul style="list-style-type: none"> ● <i>Where have I seen measuring happening before?</i> ● <i>You learnt about capacity in Year 2</i>  <p>1l = 1000ml 2l = 2000ml</p>

I am building up a bank of written methods for division.
I am practising using a number line to find hidden groups of a number.

LANGUAGE	MEMORY LINKS
Divide by, division, hidden groups of, share equally, split equally, inverse "If I know there are 5s in 25, then groups of 5s are 250."	<ul style="list-style-type: none"> - <i>In year 3, you took jumps of a number until you reached your target number.</i>  <ul style="list-style-type: none"> - <i>Then, in year 4 you looked for hidden groups of a number on a number line.</i> 

- **Problem solving and reasoning** is embedded in all maths lessons and we value the process as much as the solution. Our children are exposed to problems in real life contexts so that they can apply their knowledge and understanding of skills to the world around them, increasing their cultural capital.
- **Memory and recall starters** are planned to revisit prior learning based on our understanding of Ebbinghaus' Forgetting Curve (*See Teaching and Learning policy*). Low stakes quizzes, odd one out and spot my mistake are examples of starters used to support children's memory of new learning and inform teachers of their understanding and readiness to move on.

Choose the correct answer:

- 32 rounded to the nearest 10 is
a) 3 b) 2 c) 30 d) 40
- 109 rounded to the nearest 10 is
a) 100 b) 10 c) 101 d) 110 ✓
- 1,678 rounded to the nearest 100 is
a) 1,700 b) 1,600 c) 1,670 d) 1,680
- 10,502 rounded to the nearest 1,000 is
a) 10,500 b) 11,000 c) 11,500 d) 10,000

Find the odd one out!

$\frac{1}{2}$ $\frac{25}{50}$ $\left(\frac{1}{3}\right)$ $\frac{3}{6}$

$\frac{1}{2} = \frac{3}{6} = \frac{25}{50}$

$\frac{1}{4}$ $\frac{2}{8}$ $\frac{4}{16}$ $\left(\frac{4}{20}\right)$

$\frac{4}{16} = \frac{4}{20}$
NOT equivalent

Spot the mistake!

- $$\begin{array}{r} 3706 \\ + 4215 \\ \hline 70921 \end{array}$$
 PV?
- $$\begin{array}{r} 6029 \\ - 371 \\ \hline 6400 \end{array}$$
 check the calc!
- $$\begin{array}{r} 5873 \\ - \square 251 \\ \hline 5,622 \end{array}$$
- $$\begin{array}{r} 1253 \\ + 4127 \\ \hline 5,380 \end{array}$$

Through our mastery curriculum, pupils are taught skills to develop procedural fluency and conceptual understanding. Meta-skills are developed through pupils gaining confidence in selecting strategies, choosing methods and being able to problem solve; growth mindset encourages pupils to persevere in seeking solutions.

Mastery	Skills	Meta-skills
Conceptual understanding	<p>How do we teach it?</p> <p>Consistent development of:</p> <ul style="list-style-type: none"> • Models and images <p>Talk:</p> <ul style="list-style-type: none"> • Vocabulary • Terminology • To articulate understanding 	<p>What do children do with it?</p> <ul style="list-style-type: none"> • Choose methods or strategies (error proof not error prone) • Choose operations • Solve problems in context, including word problems
Procedural fluency	<p>How do children gain it?</p> <ul style="list-style-type: none"> • Following a model • Making sense of procedures • Practising 	<p>Procedural fluency is largely concerned with skills.</p>

Organisation:

Our children are taught in ability groups, which are highly effective for learning, attainment and confidence. Every year group has five maths groups, which are each taught in separate classrooms by skilled practitioners. All teaching is centred on the needs of the children. Our lower attaining children are taught in smaller groups thus increasing the ratio of 1:1 time between child and adult. The groups are fluid and year group meetings are used to identify necessary changes between them. All teaching is aspirational for all pupils.

Every child has a maths pack, which is kept in their maths classroom. In it is their maths book, all the stationery that they require and some visual resources, such as hundred square. This helps the children to be well organised and prepared for each lesson and reduces time spent handing out stationery.

Learning is recorded in each child's 'maths' exercise book when it enhances or supports the children's acquisition of the concept through practice, or to support teacher assessment. Our maths learning intentions state vocabulary required for the lesson and memory links to previous learning. We know that some lessons involve learning taking place solely with concrete materials and whiteboards and, whilst a learning intention is stuck in, children are not expected to write in the books purely for evidence. Teachers may take photos of the learning, which they save in their planning folders, but are not required to stick them in the children's books, unless it supports learning. When learning is continued from the previous day, children write the new date and continue under the same LI.

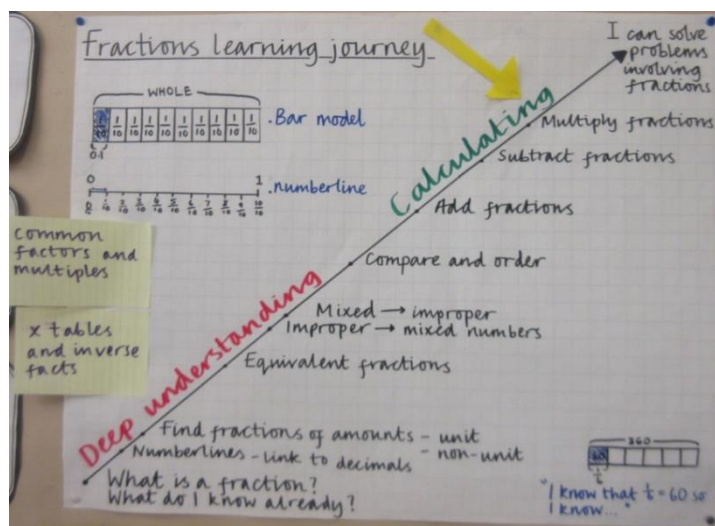
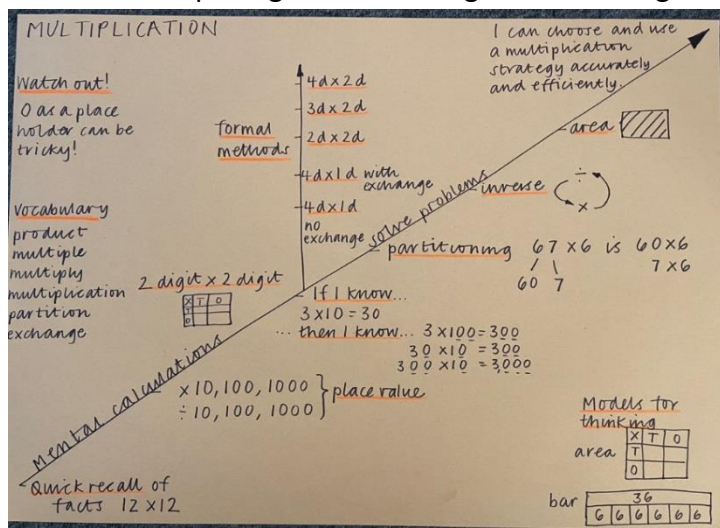
Planning:

At Blue Gate Fields, we have a bespoke maths curriculum. White Rose is our *supporting scheme*, used to ensure coverage of the Maths National Curriculum Key Stage 2 objectives and support teachers' planning. White Rose teaching schemes are designed to support a mastery approach to teaching and learning and resonate with our Golden Threads, particularly memory and recall, talk and growth mindset. The blocked yearly overview allows time for deep, conceptual learning to prevent the need for re-teaching later on in the year. Their 'small steps' learning journey aligns with our small step, guided practice teaching style and the resources demonstrate incremental challenge through lessons with opportunities to reason and problem solve, supporting the ideal of depth before breadth. They have end of block assessment, which our teachers use to assess their children's understanding of taught units.

Bespoke learning journeys:

Learning journeys demonstrate how learning is built upon over time, and support teachers and pupils to make links between stages and aspects of learning. Year group teams use the White Rose resources to support them in planning a bespoke learning journey for each unit that sequences the incremental components required for children to achieve a final outcome. Year group planning ensures shared expertise and understanding of pedagogy during the creation of a learning journey. Individual teachers then tailor the learning journeys and break them down into a sequence of carefully planned lessons that meet the needs of the children in their group.

As well as being a planning tool for teachers, learning journeys support children in understanding the connections in maths and the steps to their learning process. They are displayed on maths working walls in classrooms. Our displayed learning journeys will serve the same purpose, although their visual appearance may differ as a consequence of our deepening understanding of dual coding theory and graphic organisation.



Our teachers are encouraged to enhance problem solving and reasoning further in individual lessons through additional resources such as NRich materials and Hamilton trust. Less experienced teaching staff are supported with their planning by maths leads or experienced members of staff.

Place value is front loaded in every year group to ensure a strong foundation in the understanding of number before moving on to the rest of the maths curriculum. In line with our teaching and learning policy, teachers use starters to revisit previous learning and plan memory and recall practice into every lesson. Every year group has a place value resource box which has been carefully designed to support the teaching of numbers in that year. The resources progress from proportional (dienes) to non-proportional (place value counters) to support children's transitions from concrete to abstract and to develop their number sense. There is a multitude of resources available in room 15 to support the CPA approach used across all curriculum areas in KS2. These are organised in clearly labelled boxes and accessible to all staff for use in maths lessons.

One lesson a week is allocated to the practice of 'basic skills' where teachers and learners are able to revisit and consolidate the fundamental skills required to deepen the children's understanding of current or future concepts. Times Tables Rockstars is used to support the teaching of times tables. Pupils consolidate their knowledge of facts through memory and recall practice. Mathletics is also used in school and at home to practice new learning.

Our school calculation policies provide a progression for the teaching of calculations. They are written as a continuum and teachers are expected to teach at the point of need rather than accelerating onto content beyond readiness. These progression documents are revisited with staff to ensure that subject knowledge and pedagogy is appropriate.

Homework is set weekly by each group teacher and is generally consolidation of learning completed in the days prior. We use the White Rose homework books for the current teaching sequence to support our children's memory and recall of strategies and provide them with opportunities for high quality reasoning outside of school. The homework content is specific to each group.

Assessment:

Maths learning is predominantly assessed through responsive teaching. Teachers formatively assess knowledge, understanding and key skills during lessons through high-quality, targeted questioning, reflecting on work in books and oral feedback with children.

Our marking and feedback requirements in maths are in line with whole school *policy (See Feedback including Marking policy)*. Responsive teaching underpins assessment in maths to ensure immediate and effective feedback. Whiteboards are used as a tool for immediate feedback and enable teachers to formatively assess children's understanding in the moment. Oral feedback is used throughout lessons to ensure children are aware of their progress. As a result of these feedback strategies, we do not expect staff to write lengthy comments in books; immediate, oral feedback has a greater impact on learning and attainment. Self-marking and peer-marking is done in green pen and teachers are expected to check accuracy, before the next lesson.

Summative assessment is carried out at the end of each unit of work, using the White Rose end of block assessment. These tests are delivered as low-stakes testing and aim to provide both teachers and students with an understanding of how well they have understood their learning.

We test at the end of Autumn Term (December) and in the Summer term (June) using NFER tests which inform pupil progress and action.

All assessment at Blue Gate Fields Junior School enables teachers to adapt planning to respond to individual pupils' needs, ensure readiness for new learning and provide the appropriate level of challenge.

Teacher subject knowledge and confidence:

To ensure high-quality teaching and consistency in approaches and strategies, all staff regularly benefit from CPD regardless of their levels of experience. Maths staff meetings are used to share, develop and improve pedagogy and are either led by the maths subject leads or a TSEP consultant. We work closely with the Infant School to share teaching approaches and support the children's transition from Year 2 to Year 3. The subject leads and other members of the teaching staff have enriched their teaching with external training by organisations and individuals such as NRICH, White Rose, Mike Askew, Andrew Jeffrey and Liz Gibbs.

The subject leads develop their leadership approaches through support and development with the MCubed partnership, working collaboratively alongside other Tower Hamlets schools.

Environment:

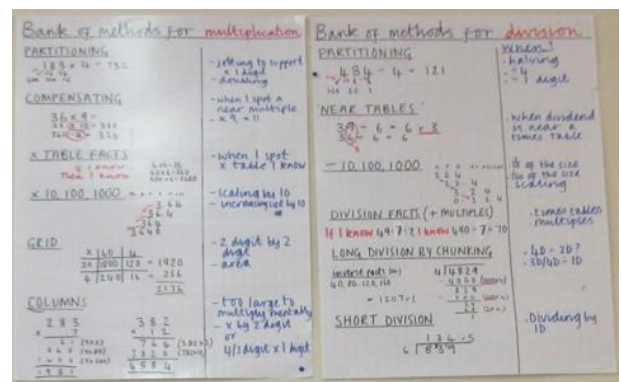
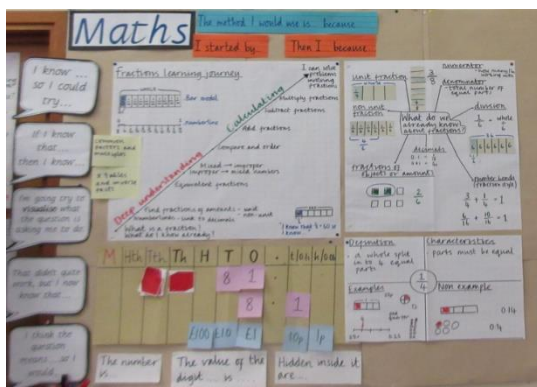
It is essential that the classroom culture and environment supports the learning and teaching of maths.

We provide a mathematically stimulating environment built on trust and growth mindsets. Children accept that struggle, setback and failure are a part of learning, and pupils enjoy grappling with learning that they consider 'tricky'.

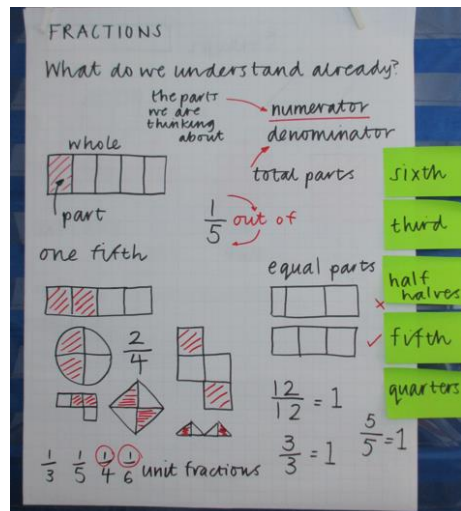
We believe that maths displays conducive to learning should be distraction free and useful to the pupils in the moment.

We ensure this:

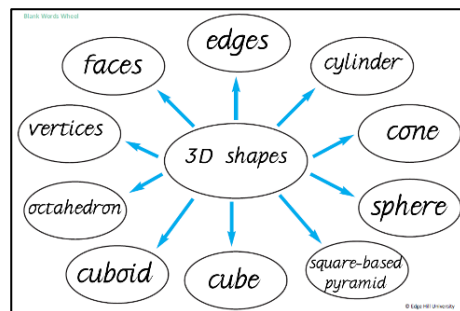
- through **working walls** in every classroom, which support memory and recall
- by displaying a **learning journey** so children know where they are with their learning and where they are going next



- through displaying **models and images** to support the learning of new material



- through displaying **reasoning questions and sentence stems** to promote and support high quality talk and reasoning in every lesson
- through displaying **carefully selected, relevant vocabulary** to support acquisition



- through providing a wide range of **resources** for teacher and pupils to use readily
- by equipping children with **number lines, hundred squares and multiplication squares** in their maths packs
- by using the **year group blogs** to raise awareness of maths and share examples of problem solving
- by promoting a love of maths more widely across school through events, such as World Maths Week and aspiration day.

Equality:

Our curriculum is bespoke and inclusive; all children work on the same journey adapted to support them to be secure and successful on their individual journey. Lessons are adapted by each teacher to meet the individual needs of the children that they teach.

Differentiation of the learning supports and challenges all children in the class, including children with special educational needs and disabilities. Large-print resources are prepared for children with visual impairments to enable them equal access to the learning. Visual displays with images next to key vocabulary supports children with English as an Additional Language. Teachers also model the correct use of new vocabulary and support the children to use it accurately in oral and written work. As a school, we are committed to aspirational learning for all.