

# Kelvedon Hatch Community Primary School

## Mathematics Policy



***SCHOOL STAFF WERE CONSULTED ON THIS DOCUMENT AND IT WAS  
ACCEPTED BY GOVERNORS SEPTEMBER 2018:***

***POLICY TO BE REVIEWED SEPTEMBER 2022***

## **MATHEMATICS Policy for Kelvedon Hatch Community Primary School**

At KHCPS learning in every subject will be based on the key elements contained within our Learning and Teaching Pedagogy Policy:

### **Show Me Boards**

- Use of Show Me boards ensure all children are actively engaged and that prior learning (memories) become stronger, thus creating stronger pathways in the brain, enabling learners to build on prior knowledge.
- Show Me boards also play a crucial part in using assessment for learning to identify misconceptions immediately, allowing adults to address these at whole class or individual level immediately.
- Use of Show Me boards generates pace.
- Show Me boards should be used at the start of the lesson to revise previously taught knowledge, processes or skills in order to strengthen memory pathways in the brain.
- Show Me boards can also be used during lessons in order to enable instant whole class assessment, particularly when an 'next step' concept has been taught midway through a lesson.

### **Additional themes that underpin our pedagogy:**

- Lessons implicitly or explicitly reflect on our support of the UN Convention on the Rights of the Child (UNCRC).
- Our strong sense of social responsibility is explicitly discussed within the context of lessons whenever possible.
- Our concrete, pictorial, abstract approach enables all children to access learning.
- Lessons actively encourage children to undertake research based on self-interest (where possible, children have access to research materials, including iPads).
- Where possible, lessons are topic-based and have links with other areas of the curriculum. For example, English skills would be explicitly referred to when writing a method in science.
- Use of I.C.T. equipment supports research and enables enhanced access to the curriculum where appropriate and possible.
- There is a culture of celebrating children's work through referring to very specific elements of the child's work or learning behaviour.
- Adults model (explicitly) how children can meet the given success criteria.
- Adults model the desired learning behaviour through modelling enthusiasm, collaborative learning, use of resources, self-interest research, referring to steps of challenge and success criteria to know if answers are correct / objectives have been achieved.
- Parents are informed of the curriculum at meetings and access to the curriculum overview is on the school website.
- Whenever possible, exciting concrete resources, footage or trips bring topics to life and feed interest and a desire to research.

## **Inclusion and Equal Opportunity**

Kelvedon Hatch Community Primary School, Mission Statement

***Joyous, caring, respectful and ambitious***

*'We are a joyful, creative school that promotes a love of learning within a caring, respectful environment.'*

### **Joyous**

We aim to create learning environments that are inspiring, fun and memorable, within a school community that loves learning and celebrates the successes made by all children, at every stage of their learning journey.

### **Caring**

Children, staff and the wider school community care about the wellbeing of others, both within the school community and the wider world community. We nurture and support one another's emotional and social development and respect and celebrate our differences.

### **Respectful**

Our school community holds respect at the core of all we do; we consider carefully the consequence of our actions and words, mindful of the impact these may have on others. We celebrate the progress and effort of those around us.

### **Ambitious**

We strive to be the best we can in all aspects of life: manners, kindness, effort, work, regardless of our starting points, disability, ethnicity, faith or culture. We are all capable.

Care should be taken to give each child the opportunity to learn about the global community, regardless of race, Religion, language, gender or economic status.

Our aim is that no child should be advantaged or disadvantaged due to their race, religion, language, gender or economic status.

Pupils with learning difficulties can be given greater access to the whole curriculum through the use of Computing. They are able to improve the accuracy and presentation of their work and this can improve their motivation and raise self-esteem. A variety of software and tools have been sourced to support this work. Where necessary, pupils are given additional support to provide access to the curriculum. Specialist software and hardware is made available for pupils with specific difficulties, for example, roller ball mice for pupils with co-ordination problems, magnification software for pupils with sight problems and software to support pupils with developing numeracy and literacy skills. Computing is used to provide additional activities to extend and challenge gifted and talented pupils.

## **Maths specific elements of our pedagogy:**

### **Aims**

- Flexible resources to support learning and teaching across the curriculum
- To apply taught skills across the curriculum, where possible.
- To make explicit links to real-life contexts to enable transfer of knowledge and skills.
- To explore the relevance of mathematics in everyday life.
- To make explicit links to social responsibility.
- To ensure continuity and progression.
- To deliver the National Curriculum requirements:

### **The National Curriculum for Mathematics**

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The 2014 National Curriculum programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

### **Mastery**

At KHCPS we take a 'mastery' approach and expect all children to have a deep understanding of key concepts before we move on to a new one. We recognise that at times pupils may need some methods to be simplified or extended to suit their learning needs.

By adopting a mastery approach future mathematical learning is built on solid foundations which are revised through daily Maths Meetings. Teaching is focused, rigorous and thorough, to ensure that learning is sufficiently embedded and sustainable over time. Mastery of the curriculum requires that all pupils:

- use mathematical concepts, facts and procedures appropriately, flexibly and fluently;
- recall key number facts with speed and accuracy and use them to calculate and work out unknown facts;
- have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems.

All children are given the opportunity to attempt set work, choosing for themselves from a range of progressively challenging stars based on skills, sharing the aims of the 2014 national curriculum for Mathematics 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.

Concrete materials and pictorial representations are used to scaffold children's conceptual understanding where appropriate. All children have access to a range of practical manipulatives during lessons. This underpins the mastery approach to mathematics with the intention that all children can access the curriculum, enabling them to achieve confidence and competence in mathematics and the conceptual understanding needed to develop their maths skills in the future.

Working walls are used to reflect the current learning including steps to success and shared problems. Models include concrete, pictorial and abstract representations of problems where appropriate. These working walls enable children to self-assess and move to the next stage of challenge.

### **Maths meetings**

Children partake in daily 'maths meetings' – an opportunity for children to consolidate and practice the mathematical skills they have acquired. These are 10-15 minute, fast-paced sessions, generally made up of 3 activities followed by a problem solving question. These are planned so that over the course of a week children will have covered all aspects of the mathematics curriculum.

### **Calculation in Mathematics**

The 2014 National Curriculum progression in written methods of calculation highlights how children should move from informal methods of recording to expanded methods that are staging posts to a compact written method for each of the four operations.

Children are introduced to the processes of calculation through practical, oral and mental activities. As children begin to understand the underlying ideas they develop ways of recording to support their thinking and calculation methods and learn to interpret and use the signs and symbols involved. Over time children learn how to use models and images, such as bar models, whole-part-part models and empty number lines,

to support their mental and informal written methods of calculation. As children's mental methods are strengthened and refined, so too are their informal written methods. These methods become more efficient and succinct and lead to efficient written methods that can be used more generally.

The table below sets out the progression in calculation for the four operations. It should be read in conjunction with our calculation policy which is attached as Appendix 1.

	EYFS/Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Combining two parts to make a whole: part whole model.  Starting at the bigger number and counting on- using cubes.  Regrouping to make 10 using ten frame.	Adding three single digits.  Use of base 10 to combine two numbers.	Column method- regrouping.  Using place value counters (up to 3 digits).	Column method- regrouping.  (up to 4 digits)	Column method- regrouping.  Use of place value counters for adding decimals.	Column method- regrouping.  Abstract methods.  Place value counters to be used for adding decimal numbers.
Subtraction	Taking away ones  Counting back  Find the difference  Part whole model  Make 10 using the ten frame	Counting back  Find the difference  Part whole model  Make 10  Use of base 10	Column method with regrouping.  (up to 3 digits using place value counters)	Column method with regrouping.  (up to 4 digits)	Column method with regrouping.  Abstract for whole numbers.  Start with place value counters for decimals- with the same amount of decimal places.	Column method with regrouping.  Abstract methods.  Place value counters for decimals- with different amounts of decimal places.
Multiplication	Recognising and making equal groups.  Doubling  Counting in multiples Use cubes, Numicon and other objects in the classroom	Arrays- showing commutative multiplication	Arrays  $2d \times 1d$ using base 10	Column multiplication- introduced with place value counters.  (2 and 3 digit multiplied by 1 digit)	Column multiplication  Abstract only but might need a repeat of year 4 first (up to 4 digit numbers multiplied by 1 or 2 digits)	Column multiplication  Abstract methods (multi-digit up to 4 digits by a 2 digit number)
Division	Sharing objects into groups  Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups?  Use cubes and draw round 3 cubes at a time.	Division as grouping  Division within arrays- linking to multiplication  Repeated subtraction	Division with a remainder- using lollipop sticks, times tables facts and repeated subtraction.  $2d$ divided by $1d$ using base 10 or place value counters	Division with a remainder  Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division  (up to 4 digits by a 1 digit number including remainders)	Short division  Long division with place value counters (up to 4 digits by a 2 digit number)  Children should exchange into the tenths and hundredths column too

The aim is that by the end of Key Stage 2, the great majority of children should be able to use an efficient written method for each operation with confidence and understanding. The curriculum promotes the use of what are commonly known as 'standard' written methods - methods that are efficient and work for any calculations, including those that involve whole numbers or decimals. They are compact and

consequently help children to keep track of their recorded steps. Being able to use these written methods gives children an efficient set of tools they can use when they are unable to carry out the calculation in their heads or do not have access to a calculator. We want children to know that they have such a reliable, written method to which they can turn to when the need arises.

### **Opportunities for Personal, Health and Social Responsibility Education**

Use opportunities within lessons to promote the UN convention on the Rights of the Child.

Other examples could be: e-safety, exercise, relationships, food hygiene.

### **Planning**

Long- term plans are published on the school website.

Medium-term plans include: learning objectives; at least two steps of challenge; use of concrete, pictorial and abstract resources to enable equal access and a mastery approach; and cross-curricular links where possible.

### **Resources Provision**

All classes and children have access to a large range of concrete resources. In addition, there are a range of resources stored in the maths area in the infant dining hall.

### **Health and safety**

If using Maths specific equipment such as a compass, children are instructed on how to use it safely. Children are taught to act safely when using computing equipment in terms of use of plugs, wires and keeping liquids away from electrical items. E-safety is integrated into every computing lesson; please read 'E-safety Policy'.

### **Assessment, record-keeping and reporting**

Children's work is either kept in school or photographed.

For summative Maths assessments please see appendix I

Judgements are made against National Curriculum expectations and the school ROLO.

Teachers use formative assessments to provide immediate feedback to children to ensure good progress.

Teachers use formative assessments to inform planning.

Teachers make summative assessments half-termly using ongoing formative assessment, subject-specific tests, and work scrutiny against the school record of learning observation (ROLO) document. Judgements are recorded on the school Progress Tracker.

Children's progress in Maths is reported to parents through the pupil annual report and work is shown to parents at a termly 'book look'.

Assessment for Learning (AfL) is fundamental to raising standards and enabling children to reach their potential. Show Me boards are central to assessing whole class understanding during fast-paced elements of the lesson (notably Maths Meetings) as well as key points during the lesson. This enables teachers to address common misconceptions immediately (often through the use of concrete and pictorial resources) or for individuals to be identified for 1:1 intervention during the lesson. This strategy ensures the pitch of the lesson remains challenging and that adults have an accurate perception of children's learning at all times.

Children undertake self-assessment through checking their work against working walls or through the use of concrete or pictorial resources. Self-assessment is crucial in ensuring children identify the points at which they made a mistake or to progress, it also enables them to identify when they are ready to move to the next challenge (star) without waiting for teacher approval. This use of self-assessment ensures children move at a faster pace and no time is wasted on completing tasks they master quickly or they discover are too easy.

During the course of the lesson, the role of the adult is to observe learning, to question children's conceptual understanding of the task and to identify groups or individuals who require intervention. Group and individual intervention occurs immediately according to AfL observations: adults bring groups back to the carpet to address misconceptions (using resources) or to move them on to a challenge that requires a new skill; 1:1 intervention, for the same purpose, often occurs with the child at their table. Skilled use of questioning is employed to ensure children 'do the learning' and the adult remains the facilitator. Children are only sent back to their tables / work areas once they have demonstrated (using concrete, pictorial or abstract and through answering questions) a good understanding of the skill required.



## Developing and Monitoring the Maths Curriculum

Role	Responsibility
<b>The Role of Senior Management</b>	<p>The overall responsibility for the use of Maths rests with the senior management of a school. The Head, in consultation with governors and staff:</p> <ul style="list-style-type: none"><li>• determines the ways Maths should support, enrich and extend the curriculum;</li><li>• decides the provision and allocation of resources;</li><li>• decides ways in which developments can be assessed, and records maintained;</li><li>• ensures that Maths is used in a way to achieve the aims and objectives of the school;</li><li>• ensures that there is a Maths policy, and identifies the Maths Lead.</li></ul>
<b>The Role of the Maths Lead</b>	<p>The designated lead should:</p> <ul style="list-style-type: none"><li>• ensure the development of an effective Maths Curriculum.</li><li>• promote, support and monitor the use of Maths across the curriculum;</li><li>• manage the provision and deployment of resources</li><li>• coordinate the evaluation and review of the school's Maths policy.</li><li>• There is a clear distinction between teaching about Maths and teaching with Maths.</li></ul>
<b>The Role of The Teacher</b>	<p>Even though whole school co-ordination and support is essential to the development of Maths capability, it remains the responsibility of each teacher to plan appropriate Maths activities and assist the Maths Lead in the monitoring and recording of pupil progress in Maths.</p>

Mathematics in the Foundation Stage is assessed as part of the EYFS profile through classroom observations. Termly arithmetic and problem solving progress checks (White Rose Maths) are carried out from Year 1 - 6 and are used to inform teacher assessments. National SATs tests are carried out at the end of Year 2 and 6.

Parent consultation evenings are held in the Autumn, Spring and Summer terms where children's progress and achievements are discussed. All parents receive a yearly written report which includes a summary of their child's achievements related to the expected standard for their year group.

### Appendix I

#### Autumn 1

	Maths
Reception	Numerals recognition check 1:1 correspondence when counting objects One more/less
Year 1	N/A
Year 2	N/A
Year 3	N/A
Year 4	N/A
Year 5	N/A
Year 6	N/A

## Autumn 2

	Maths
Reception	Numerals recognition check 1:1 correspondence when counting objects One more/less
Year 1	White Rose Summative Assessment Test
Year 2	White Rose Summative Assessment Test
Year 3	White Rose Summative Assessment Test
Year 4	White Rose Summative Assessment Test
Year 5	White Rose Summative Assessment Test
Year 6	White Rose Summative Assessment Test

## Spring 1

	Maths
Reception	Numerals recognition check 1:1 correspondence when counting objects One more/less
Year 1	N/A
Year 2	N/A
Year 3	N/A
Year 4	N/A
Year 5	N/A
Year 6	N/A

## Spring 2

	Maths
Reception	Numeral recognition check 1:1 correspondence when counting objects One more/less
Year 1	White Rose Summative Assessment Test
Year 2	White Rose Summative Assessment Test
Year 3	White Rose Summative Assessment Test
Year 4	White Rose Summative Assessment Test
Year 5	White Rose Summative Assessment Test
Year 6	White Rose Summative Assessment Test

## Summer 1

	Maths
Reception	Numeral recognition check 1:1 correspondence when counting objects One more/less
Year 1	N/A
Year 2	
Year 3	N/A
Year 4	N/A
Year 5	N/A
Year 6	Science: end of year test

## Summer 2

	Maths
Reception	Numeral recognition check 1:1 correspondence when counting objects One more/less
Year 1	White Rose Summative Assessment Test
Year 2	White Rose Summative Assessment Test
Year 3	White Rose Summative Assessment Test
Year 4	White Rose Summative Assessment Test
Year 5	White Rose Summative Assessment Test
Year 6	N/A