



Rockland St Mary and Surlingham Primary School

Maths Policy

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Executive summary	This policy has been reviewed and amendments made to reflect the use of Power Maths, mastery and the times table check.
Review Body	Teaching staff
Endorsed by	Governing Body
Review frequency & next review due	Annually – September 2020
Comments	<p>This policy is available on our school website and is available on request from the school office.</p> <p>This policy will be reviewed in full by the Governing Body on an annual basis.</p>

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This policy details the key aspects of mathematics teaching and learning at Rockland st Mary Primary School and Surlingham Primary School. It is intended to inform teaching staff, support staff, school leadership, the school governing body, parents and external visitors about what mathematics typically looks like at this school.

This is our philosophy:

- Using the **mastery** approach, we support our children to acquire a deep, long-term, secure and adaptable understanding of mathematics;
- Through following the **three aims** of the 2014 National Curriculum, we allow our children to:
 - Become **fluent** in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time;
 - **Reason mathematically** by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language;
 - **Solve problems** of increasing sophistication, including breaking problems down into simpler steps, and persevering in seeking solutions;
- By using **concrete, pictorial and abstract (CPA)** representations of mathematical problems, our children can approach a single concept in multiple ways, moving through each one in any order depending on their need and level of understanding;
- Rather than simply memorising procedures or facts, we teach our children to know, as well as be able to show and explain, how and why their mathematics works the way it does.

These are the key features of mathematics in our school:

- Teachers spend more time delivering each topic, to allow all children to gain a secure understanding before moving on to the next one;
- Mixed ability grouping / seating, which allows children to work with a broad spectrum of mathematically-confident peers in their classroom across the school year;
- Lots of talking about mathematics – children answering in full sentences and providing reasoned responses to questions;
- Extensive opportunities for problem solving;
- Mini-plenaries during lessons, where pupils can share misconceptions, pose questions, challenge ideas and make and/or prove conjectures;
- Free access (for all pupils, in all year groups) to concrete manipulatives such as Numicon, counters, bead strings, number lines etc.

This is how it works:

- Through ‘Power Maths’, the Department for Education-approved mastery-based scheme of learning, children approach concepts at largely the same level of difficulty. However, teachers may choose to move children on to more challenging tasks earlier in the lesson, if they feel it is appropriate, to allow them to deepen their understanding;
- In KS1, maths investigation stations / maths areas are set up on a weekly basis, to link to current or previous week’s learning;

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- Teachers use correct mathematical language in their delivery of content, perhaps employing a 'word of the day' or related vocabulary, and displaying these on working walls for children to see and make use of in their learning;
- Teachers use stem sentences - a stem sentence often expresses key conceptual ideas or generalities and will provide a framework to embed conceptual knowledge and build understanding.
- There are frequent opportunities to talk mathematically, both to the teacher and to each other;
- Children are given the time they need to solve problems (returning to a task in a subsequent lesson, for example), meaning that sessions are more 'fluid' than they are 'compartmentalised';
- Teaching assistants (TAs) are sometimes used to pre/post-teach concepts to targeted pupils ahead of a lesson, to ensure any gaps in learning are filled effectively.

This is what staff do:

- Plan lessons with a focus on the 'three aims' (see above);
- Reflect on lessons in order to inform next steps for individuals and groups of children;
- Incorporate social, moral, spiritual and cultural (SMSC) elements in our teaching;
- Encourage positive attitudes to mistakes / misconceptions, in discussions and in the learning environment;
- Participate in regular book scrutinies, learning walks, planning audits and pupil perception sessions;
- Engage in collective professional development, both as a school and as part of the Sapientia Education Trust;
- Raise the profile of mathematics through Maths Cafés, STEM week, whole-school challenges to motivate children and celebrate their learning;
- Encourage parental involvement in their children's maths journeys through school.

This is what you might typically see and hear in our classrooms:

- Open-ended investigations, including low threshold/high ceiling tasks to ensure access for all pupils;
- Word problems that encourage pupils to 'find the maths' contained within;
- Pupils talking mathematically, making conjectures and applying reasoning skills to problems;
- Calculations represented in different ways – missing digit problems, 'Here's the answer, what's the question?', CPA representations;
- Paired / group work;
- Working walls containing relevant examples of work, key vocabulary and photographic evidence;
- Active maths, where pupils move around the room or work outside;
- Teachers encouraging pupils to discuss and prove / challenge other pupils' conjectures and ideas.
- TAs supporting small groups, either inside or outside of class, based on misconceptions that have been identified during lessons, promoting the progression of all children rather than some.

This is what you might see on our working walls:

- Examples of work;
- relevant module-specific vocabulary;
- Stem sentence to do with the current module;
- Evidence of mistakes and misconceptions to promote positive attitudes to these;

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- Photos of children working;
- Examples of children using CPA approaches;
- Number lines - differentiated by year group (for example, 0-100 in KS1, negative numbers/ratio lines in UKS2) and big enough for children to get up and use freely.

This is how we know how well our pupils are progressing:

- Prompt marking of classwork, with appropriate feedback and corrections given when appropriate – green highlighters to show correct working, pink highlighter to ‘think’ and have another look.
- Pupil progress meetings based on formative and summative assessment data;
- Termly teacher assessment judgements and target-setting;
- Photo evidence of practical maths in books, annotated by either the teacher (KS1) or the pupil (KS2) so that the learning journey is clear, including any mistakes and misconceptions that were encountered;
- Targeted use of TAs, who make notes about observations of, and discussions with, pupils.

This is the impact of our teaching:

- Confident children who can talk about maths in a positive manner;
- Children displaying a real love of the subject, putting it in their ‘top 3’ lessons;
- A depth of understanding and the ability to apply this in a variety of contexts.

This is how we challenge higher attaining pupils / rapid graspers:

- Move them on to more challenging tasks within the Power Maths scheme of work earlier in the lesson, rather than asking them to solve problems that they are likely to tackle without difficulty;
- Encourage them to use higher-order thinking skills to solve problems in a range of contexts;
- Ask for developed reasoning and justification in support of an answer or solution;
- Encourage them to support other pupils, to help spot any misconceptions in their working and model the correct steps to solve a problem;
- Ask them to make generalisations and conjectures, and test (prove / disprove) these.

Guidance for the teaching of Multiplication Facts

Our schools are small, rural schools with mixed age classes. We teach multiplication facts at the start of the school day in morning maths time as well as some specific content during maths lessons. We use Timetable Rockstars as our main resource for monitoring our pupil’s knowledge of multiplication facts. We use the heat maps to identify which questions our children find the most challenging. The teachers use this information to inform their next steps in the teaching sequence.

We use Timetable Rockstars to test our children’s knowledge of multiplication facts every week. Each child will take 3 timetable tests per school week which will focus on the times table taught that week. The results from this are put into the online tracking system so that the teacher can monitor how confident the pupils are and how quickly their children can answer the question.

In our schools we use a range of manipulatives to support our pupils in the development of their knowledge of multiplication facts. We use:

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- Numicon to show multiplication as repeated addition.
- The counting stick to support knowledge of facts rather than just counting in steps.
- Arrays to enable children to calculate unknown multiplication facts.
- A multiplication grid to support use of other manipulatives - to look for patterns and to identify relationships between different facts.
- Videos and songs to help children to learn the multiplication facts.

Each year group teaches specific multiplication facts. These are the end of year expectations for each year group:

Year 1 – count in multiples of 10, 2 and 5 in order fluently

Year 2 – Recall multiples of 10, 2, 5 in any order including missing numbers and related division facts. Count in multiples of 3 to 12x3 in order with growing fluency.

Year 3 – Recall multiples of 3, 4 and 8 in any order including missing numbers and related division facts.

Year 4 – Recall multiples of 6, 7, 9, 11 and 12 in any order including missing numbers and related division facts.

Years 5 and 6 – consolidation of previous learning - recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts.

We explore the connections between 2,4,8 as doubling. We explore the connections between 3,6,9,12 by doubling / tripling. We teach children to use the facts they know to work out known facts. For example if pupils find 9x difficult, can they use 10x and take away 1x? E.g 6×9 . $6 \times 10 = 60$, $60 - 6 = 54$. (Compensating) We teach the related division facts as the children learn the multiplication facts so they see the link between the two. We teach both the multiplication and division facts

After looking at the heat map we identify which specific facts the children find it difficult to grasp and we teach linked facts, look for patterns and make links to other known facts.

We use Timestable Rockstars so the children can play the games / have some extra time to prepare rise. We try to engage parents by holding maths cafes and encouraging them to use Timestable Rockstars at home with their children.