

Mathematics Policy

Author/ Edited By	Christopher Brown
Review Body	Teaching staff
Approved	By the Local Governing Body
Next Review Due	Annually – July 2021

Policy Consultation & Review

This policy is available on our school website and is available on request from the school office.

This policy will be reviewed in full by the Governing Body on an annual basis.

Signature _____
Helen Mitchell, Executive Headteacher

Date:

Signature _____
Chris Archer, Chair of Governors

Date:

This policy details the key aspects of mathematics teaching and learning at Old Buckenham 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;
- 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;
- There are frequent opportunities to talk mathematically, both to the teacher and to each other;
- Using ‘answer, prove, explain’ (APE), pupils are expected to demonstrate their understanding in multiple ways, to avoid the focus being purely on getting the correct answer;
- 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-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.

This is what you will see on our working walls:

- Examples of pupils' work;
- 'Word of the day' and any other relevant module-specific vocabulary;
- Stem sentence to do with the current module;
- Evidence of mistakes and misconceptions to promote positive attitudes to these;
- 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 'next steps' given;
- 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 use intervention:

- Use TAs to support 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 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.

This is how we teach times tables:

- Deliver times tables in the following order, incrementally from years 1-6, with the expectation that children will be fluent in these facts by the time they progress to the next year group:
 - Year 1 – 1x, 2x, 5x and 10x
 - Year 2 – Consolidation of above, plus 3x
 - Year 3 – Consolidation of above, plus 4x and 8x
 - Year 4 – Consolidation of above, plus 6x, 7x, 9x, 11x and 12x
 - Year 5 – Consolidation of all facts to 12x12, tracking back to fill gaps where necessary
 - Year 6 – Consolidation of all facts to 12x12

NB: Teachers will refer to to the Third Space Learning 'Times Tables Termly Planner' document to help them decide when each set of facts is to be taught throughout the school year.

- Practise facts using concrete apparatus (such as Numicon) to model the calculations and demonstrate multiplication as repeated addition, exploring connections between 2, 4 and 8 by doubling (and 3, 6, 9 and 12 by doubling and tripling), using a counting stick or online app to support or test knowledge of facts, or other methods at the teacher's discretion;
- Test children regularly in class so that teachers can monitor progress and support as required;
- Encourage independent practice at home via Times Tables Rockstars, in order to build fluency and recall with multiplication and division facts.