

Sundridge & Brasted C of E Primary School

Maths Policy



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Maths Policy

Our Vision

At Sundridge & Brasted CE Primary School, we believe that each of us is made in the image of God. God loves every one of us. We value every member of our community, and support them to shine! “You are the light of the world. A town built on a hill cannot be hidden.”(Matthew 5 verse 14, New International Version)

We welcome everyone to our school community, whether of Christian faith, other faith or of no faith at all. We recognise that each person has unique gifts and seek to enable them to fulfil their God-given potential. “See how very much our father loves us, for he calls us his children, and that is what we are!” (1 John 3 v1, New Living Translation)

Vision tagline: “You are the light of the whole world”

Distinctive Christian values: Honesty, Kindness, Respect, Responsibility, Forgiveness & Love

“At Sundridge & Brasted, all children will become resilient, fluent mathematicians with an ability to tackle problem solving.”

We live in a complex, high technology society where a wide range of mathematical concepts and skills is needed, both in work and non-work situations.

Maths is a core subject, in the National Curriculum. Mathematical understanding is also required in most other National Curriculum subjects for e.g. science, technology, geography

Maths is:

- A search for patterns and relationships
- A way of thinking
- A means of communication
- A creative activity, involving invention, intuition and discovery.

Doing maths involves:

- Deciding which questions, problems, investigations, hypotheses
- Gathering relevant information
- Creating mathematical models or an algorithm
- Manipulating models or carrying out algorithms
- Interpreting or explaining results
- Communicating the findings.

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Our key principles

- All children have access to the mastery curriculum. See appendix 1 for The 5 Big Ideas
- Published by NCETM.
- Fluency, Reasoning and problem solving are embedded within each of our units
- across all year groups.
- Children are supported in their understanding through the use of concrete, pictorial and abstract representations.
- All children think positively about maths.

Implementation

What will typically be seen in classrooms:

- Children being taught within mixed year group classes by their class teacher. Teachers will use the Ready to Progress criteria and the curriculum prioritisation framework developed by NCETM, alongside the White Rose maths curriculum to plan appropriate lessons that ensures that both year groups in their classes are able to achieve the year group criteria.
- All children from year 1 upwards have 2 maths sessions a day, a shorter Mastering Number session that specifically looks at fluency (see appendix 2 for progression) and the deep understanding of numbers and a longer more formal maths lesson based on the White Rose material.
- Flexible groupings and mixed ability talk partners will be used to provide support for children according to assessment information. Children have the opportunity to work independently, within pairs or as a group.
- Concrete manipulatives are available in every classroom and are accessible for children to use as directed or independently.
- When appropriate children can choose their starting points in lessons and are able to move themselves on if they feel they are able to do something. Children complete '5' questions that are similar and are then moved onto something more challenging.
- Challenges are readily available for children to move onto at their discretion or as directed by the teacher/TA.
- Stem sentences with correct vocabulary are used from reception onwards and often support by gesture to help the children with their understanding.
- Working walls are used to remind children of the words, sentences and strategies being used in that unit so they have a point of reference.
- Teachers and TAs move round the classroom and actively respond, challenge and support children with their learning.
- Additional time is given to teaching and learning multiplication facts. This will be supported by the use of Times Tables Rock Stars.

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Planning

Pupils in Year One through to Year Six will be taught using the White Rose mixed year group curriculum (version 3). Our Reception class will be taught using the Mastering Number curriculum. The whole school will have mastering number sessions planned by the NCETM once a day 4 x a week.

All teachers understand the importance of not rigidly following planned schemes but using their knowledge to adapt these to the needs of their pupils, e.g. spending more time of some topics, revisiting a previous year if the foundation is shown to be missing etc.

Assessment

White Rose maths provide 'flashback' activities for each unit which are short tasks designed to check how well pupils are retaining the content they have been taught previously in the unit.

At the end of each unit, pupils complete the White Rose end of unit assessments. Teachers use these assessments alongside their day to day assessments to make judgements about next steps for each pupil.

Use of research to inform our curriculum planning

As a member of the Kent and Medway Maths Hub we ensure that we are always utilising up to date research into the teaching of mathematics and use this to inform our curriculum planning. Most recently, staff now use the Education Endowment Foundations research into Improving Mathematics research findings (see appendix 3). These findings, alongside our use of the DFE Ready to Progress Criteria and the NCETM Mastery resources, ensure that the teaching of Maths in every class is strong.

Impact

It is intended that, children will:

- increase enjoyment, resilience, understanding, and attainment in maths
- secure long-term, deep and adaptable understanding of maths which they can apply in different contexts
- take new ideas or relationships and incorporate them into their current understanding and see how they connect with ideas and relationships they have encountered previously
- have more memorable and enjoyable experiences in maths that are more likely to be remembered in the long term

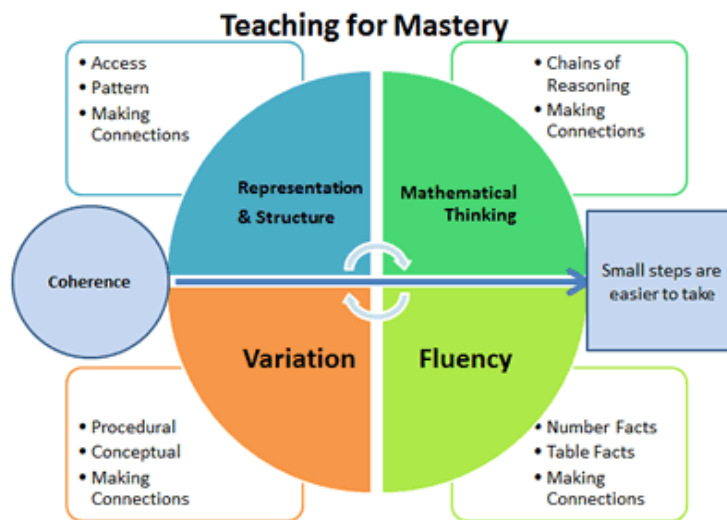
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- set themselves high expectations for their learning as they understand how to push the boundaries of what they know and apply it to solve problems
- have achieved age-related expectations for their year group. Children who have gaps in their knowledge will achieve their best possible outcome, having received appropriate support and intervention.

The impact of our Maths curriculum is measured through the monitoring cycle in school.

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Appendix 1 - What is Maths mastery that underpins all we do?



A true understanding of these ideas only come about only after training and discussion. Most teachers are at different levels in their mastery journey, but they underpin all the maths schemes used and this is a brief explanation:

Coherence

Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation. This means that teachers have to choose carefully the representations used for any specific topic.

Mathematical Thinking

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others.

Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Variation

Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

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Appendix 2 – Fluency Progression taken from Ready to progress document

Factual fluency progression

	Year 1	Year 2	Year 3	Year 4	Year 5
Additive factual fluency	Addition and subtraction within 10.	Addition and subtraction across 10.	Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.		
Multiplicative factual fluency			Recall the 10 and 5 multiplication tables, and corresponding division facts.	Recall the 3, 6 and 9 multiplication tables, and corresponding division facts.	Secure and maintain fluency in all multiplication tables, and corresponding division facts, through continued practice.
			Recall the 2, 4 and 8 multiplication tables, and corresponding division facts.	Recall the 7 multiplication table, and corresponding division facts.	
				Recall the 11 and 12 multiplication tables, and corresponding division facts.	

Appendix 3 – EEF Guidelines

IMPROVING MATHEMATICS IN THE EARLY YEARS AND KEY STAGE 1

Summary of recommendations



<p>1</p> <p>Develop practitioners' understanding of how children learn mathematics</p> 	<ul style="list-style-type: none"> • Professional development should be used to raise the quality of practitioners' knowledge of mathematics, or children's mathematical development and of effective mathematical pedagogy. • Developmental progressions show us how children typically learn mathematical concepts and can inform teaching. • Practitioners should be aware that developing a secure grasp of early mathematical ideas takes time, and specific skills may emerge in different orders. • The development of self-regulation and metacognitive skills are linked to successful learning in early mathematics.
<p>2</p> <p>Dedicate time for children to learn mathematics and integrate mathematics throughout the day</p> 	<ul style="list-style-type: none"> • Dedicate time to focus on mathematics each day. • Explore mathematics through different contexts, including storybooks, puzzles, songs, rhymes, puppet play, and games. • Make the most of moments throughout the day to highlight and use mathematics, for example, in daily routines, play activities, and other curriculum areas. • Seize chances to reinforce mathematical vocabulary. • Create opportunities for extended discussion of mathematical ideas with children.
<p>3</p> <p>Use manipulatives and representations to develop understanding</p> 	<ul style="list-style-type: none"> • Manipulatives and representations can be powerful tools for supporting young children to engage with mathematical ideas. • Ensure that children understand the links between the manipulatives and the mathematical ideas they represent. • Ensure that there is a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept. • Encourage children to represent problems in their own way, for example with drawings and marks. • Use manipulatives and representations to encourage discussion about mathematics. • Encourage children to use their fingers— an important manipulative for children.
<p>4</p> <p>Ensure that teaching builds on what children already know</p> 	<ul style="list-style-type: none"> • It is important to assess what children do, and do not, know in order to extend learning for all children. • A variety of methods should be used to assess children's mathematical understanding, and practitioners should check what children know in a variety of contexts. • Carefully listen to children's responses and consider the right questions to ask to reveal understanding. • Information collected should be used to inform next steps for teaching. Developmental progressions can be useful in informing decisions around what a child should learn next.
<p>5</p> <p>Use high quality targeted support to help all children learn mathematics</p> 	<ul style="list-style-type: none"> • High quality targeted support can provide effective extra support for children. • Small-group support is more likely to be effective when: <ul style="list-style-type: none"> • children with the greatest needs are supported by the most experienced staff; • training, support and resources are provided for staff using targeted activities; • sessions are brief and regular; and • explicit connections are made between targeted support and everyday activities or teaching. • Using an approach or programme that is evidence-based and has been independently evaluated is a good starting point.

Improving Mathematics in Key Stages Two and Three – Recommendations Summary

1

Use assessment to build on pupils' existing knowledge and understanding

- Assessment should be used not only to track pupils' learning but also to provide teachers with information about what pupils do and do not know
- This should inform the planning of future lessons and the focus of targeted support
- Effective feedback will be an important element of teachers' response to assessment
- Feedback should be specific and clear, encourage and support further effort, and be given sparingly
- Teachers not only have to address misconceptions but also understand why pupils may persist with errors
- Knowledge of common misconceptions can be invaluable in planning lessons to address errors before they arise

2

Use manipulatives and representations

- Manipulatives (physical objects used to teach maths) and representations (such as number lines and graphs) can help pupils engage with mathematical ideas
- However, manipulatives and representations are just tools: how they are used is essential
- They need to be used purposefully and appropriately to have an impact
- There must be a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept
- Manipulatives should be temporary; they should act as a scaffold that can be removed once independence is achieved

3

Teach pupils strategies for solving problems

- If pupils lack a well-rehearsed and readily available method to solve a problem they need to draw on problem-solving strategies to make sense of the unfamiliar situation
- Select problem-solving tasks for which pupils do not have ready-made solutions
- Teach them to use and compare different approaches
- Show them how to interrogate and use their existing knowledge to solve problems
- Use worked examples to enable them to analyse the use of different strategies
- Require pupils to monitor, reflect on, and communicate their problem solving

4

Enable pupils to develop a rich network of mathematical knowledge

- Emphasise the many connections between mathematical facts, procedures, and concepts
- Ensure that pupils develop fluent recall of facts
- Teach pupils to understand procedures
- Teach pupils to consciously choose between mathematical strategies
- Build on pupils' informal understanding of sharing and proportionality to introduce procedures
- Teach pupils that fractions and decimals extend the number system beyond whole numbers
- Teach pupils to recognise and use mathematical structure

5

Develop pupils' independence and motivation

- Encourage pupils to take responsibility for, and play an active role in, their own learning
- This requires pupils to develop metacognition – the ability to independently plan, monitor and evaluate their thinking and learning
- Initially, teachers may have to model metacognition by describing their own thinking
- Provide regular opportunities for pupils to develop metacognition by encouraging them to explain their thinking to themselves and others
- Avoid doing too much too early
- Positive attitudes are important, but there is scant evidence on the most effective ways to foster them
- School leaders should ensure that all staff, including non-teaching staff, encourage employment in maths for all children

6

Use tasks and resources to challenge and support pupils' mathematics

- Tasks and resources are just tools – they will not be effective if they are used inappropriately by the teacher
- Use assessment of pupils' strengths and weaknesses to inform your choice of task
- Use tasks to address pupil misconceptions
- Provide examples of concepts and non-examples
- Use stories and problems to help pupils understand mathematics
- Use tasks to build conceptual knowledge in tandem with procedural knowledge
- Technology is not a silver bullet – it has to be used judiciously and less costly resources may be just as effective

7

Use structured interventions to provide additional support

- Selection should be guided by pupil assessment
- Interventions should start early, be evidence-based and be carefully planned
- Interventions should include explicit and systematic instruction
- Even the best-designed intervention will not work if implementation is poor
- Support pupils to understand how interventions are connected to whole-class instruction
- Interventions should motivate pupils – not bore them or cause them to be anxious
- If interventions cause pupils to miss activities they enjoy, or content they need to learn, teachers should ask if the interventions are really necessary
- Avoid 'intervention fatigue': interventions do not always need to be time-consuming or intense to be effective

8

Support pupils to make a successful transition between primary and secondary school

- There is a large dip in mathematical attainment and attitudes towards maths as children move from primary to secondary school
- Primary and secondary schools should develop shared understandings of curriculum, teaching and learning
- When pupils arrive in Year 7, quickly attain a good understanding of their strengths and weaknesses
- Structured intervention support may be required for Year 7 pupils who are struggling to make progress
- Carefully consider how pupils are allocated to maths classes
- Setting is likely to lead to a widening of the attainment gap between disadvantaged pupils and their peers, because the former are more likely to be assigned to lower groups