Valued Respected Believe to Achieve

Southglade Primary & Nursery School

Mathematics Policy

September 2026

Intent: Philosophy and Aims

At Southglade Primary and Nursery School we believe that every child can achieve excellence in mathematics. We embrace the **mastery approach**, which focuses on deepening understanding rather than rushing through content. By following the **White Rose Maths** progression, our curriculum is designed to develop children's fluency, reasoning, and problem-solving skills, ensuring a lifelong mathematical confidence.

Our main aims are to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics through varied and frequent practice.
- **Reason mathematically** by following a line of enquiry, conjecturing relationships, and developing an argument or justification using mathematical language.
- Can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication.

Implementation: The White Rose Framework

To achieve mastery, our school structures learning around the core principles of White Rose Maths:

The CPA Approach (Concrete, Pictorial, Abstract)

We recognise that abstract mathematical concepts require a solid foundation. Teachers introduce concepts through a structural sequence:

- **Concrete:** Pupils use physical manipulatives (e.g., base 10, tens frames, counters, Cuisenaire rods) to physically explore a concept.
- **Pictorial:** Once comfortable with objects, pupils use or draw visual representations (e.g., bar models, part-whole models, number lines) to visualize the problem.
- **Abstract:** Only when the concrete and pictorial are secure do pupils move to abstract symbols, equations, and formal methods (e.g., 34×5 or $x + 5 = 12$).

Blocked Curriculum and Progression

We follow the White Rose Maths blocks of learning across all year groups. This ensures:

- **Sufficient Time:** Topics are taught in depth over several weeks so that the vast majority of pupils master the content before moving on.
- **Interleaving:** Key themes (like place value and the four operations) are regularly revisited and built upon in subsequent blocks and terms.

Lesson Structure and Daily Delivery

A typical mathematics lesson lasts approximately 45 to 60 minutes and is structured to maximise engagement and instant feedback:

- **Retrieval Practice:** Every lesson begins with a retrieval starter. Teachers are encouraged to use retrieval activities that stretch pupils' prior knowledge and test their retrieval from last lesson, last month and last year to embed learning into long-term memory. We use a range of retrieval techniques and strategies that have been built and developed from whole school CPD cycles.
- **Direct Teaching and Guided Practice:** Teachers use White Rose resources alongside concrete resources to explicitly model new concepts. Ping-pong teaching (short bursts of input followed by immediate pupil practice) keeps engagement high.
- **Independent Practice:** Pupils complete scaffolded tasks to achieve daily learning objectives. Tasks move intentionally from varied fluency to reasoning and problem-solving.
- **Mathematical Talk:** Classrooms are rich in discussion. Teachers use stem sentences to help children articulate their thinking (e.g., *"If the whole is ___, then the part is ___"*).

We always endeavour to set work that is challenging, motivating and encourages the pupils to think about how they learn and to talk about what they have been learning. Additional enrichment opportunities are provided for pupils to further develop mathematical thinking e.g. through cooking, music, and maths investigations and games.

Assessment and Tracking

Formative Assessment

- **Live Marking:** Teachers and teaching assistants move around the room during lessons to mark work live, address misconceptions immediately, and provide instant verbal feedback.
- **Responsive Interventions:** During lessons pupils are identified for same-day or next-day rapid intervention (typically 10–15 minutes) to ensure they are ready for the next step of learning.
- **Checkpoints:** Pupils have checkpoint assessments throughout a unit of learning to check on progress and address misconceptions rather than an end of unit assessment. Any misconceptions are then taught individually or to a whole class before moving on.

Summative Assessment

- **End-of-Term Assessments:** At the end of Autumn, Spring, and Summer terms, pupils complete NFER progress tests. These provide a reliable track of progress and generate data against national age-related expectations.

Inclusion and Adaptive Teaching

The mastery approach assumes all children can succeed. Therefore, we do not pre-differentiate tasks by splitting the class into "low, middle, and high" ability groups. Instead:

- **All pupils** access the same age-appropriate core curriculum content.
- **Support** is provided through physical manipulatives, adult scaffolding, or broken-down visual clues for those who need it.
- **Deepening (not accelerating):** Rapid graspers are not pushed onto the next year group's curriculum. Instead, they are challenged through high-level reasoning problems, open-ended investigations, and tasks requiring them to explain *why* a mathematical statement is true or false.

Calculation Policy

This policy operates in absolute tandem with our school's **Calculation Policy** (found in Appendix A). This document outlines the explicit concrete, pictorial, and abstract methods that must be used uniformly across the school for addition, subtraction, multiplication, and division to ensure a seamless transition between year groups.

Home Learning and Parental Engagement

To support the mathematics taught in school, parents are encouraged to engage with:

- **White Rose 1-Minute Maths App:** Targeted particularly at Key Stage 1 and lower Key Stage 2 to build subitising and mental arithmetic confidence.
- **Parent Guides:** The school shares White Rose "Maths with Michael" videos and termly overviews so parents understand the visual methods (like bar modelling) being taught in the classroom. Parents of Year 3 and 4 pupils receive a leaflet explaining the MTC and how to support at home with times tables practise.

Early Years Foundation Stage (EYFS)

Mathematics in the Early Years is centred on developing a deep, sustainable understanding of early number, shape, spatial awareness, and measure through a rich blend of adult-led guidance and purposeful, play-based exploration. Following the statutory framework, our provision places a heavy emphasis on subitising (the ability to recognise a quantity without counting) and mastering the composition of numbers to 10 using concrete manipulatives like tens frames, dice, and loose parts. We foster a mathematically rich environment where children are encouraged to spot patterns, resolve real-world mathematical problems in their play, and articulate their thinking using precise mathematical vocabulary. This mathematical talk builds the vital conceptual foundations required for a confident transition into the Key Stage 1 mathematics curriculum.

Teaching Maths in mixed ability groups enables support for the slower graspers, as well as providing opportunities to challenge the more able. Teaching includes counting confidently, developing an in depth **understanding** of the Number System

to **10,** looking closely at the relationship between them and the patterns within those numbers.

Each maths session begins with a contextual problem which the children are encouraged to explore and problem solve using their own resources and then this leads onto a discussion with their talk partner. With this approach, there is an emphasis on teaching and embedding key vocabulary to allow the children to explain their thinking. Some of these key questions that the children will explore are:

- What do you notice?

- Is it the same?

- Is it different?

- How do you know?

- Can you prove it?

Each classroom has a Maths Area with a variety of equipment, manipulatives and natural resources accessible within the Continuous Provision. Children are presented with many opportunities to apply previously taught skills, in a variety of different ways and in different contexts until these skills are mastered and learnt deeply. Mathematical opportunities are further developed using simple games and through stories, rhymes and songs.

<u>Multiplication Tables Check (MTC)</u>

In line with statutory requirements, pupils in Year 4 participate in the Multiplication Tables Check (MTC) during the summer term. Our curriculum is purposefully structured to ensure that multiplication and division facts are not merely memorised, but deeply understood through systematic, daily retrieval practice and

visual representations (such as array models and bar models). We utilise a blend of targeted digital platforms and structured concrete resources to build rapid recall and conceptual fluency up to 12 x 12. Our primary objective is to cultivate mathematical confidence, ensuring that all pupils achieve the necessary automaticity to seamlessly access more complex fractional reasoning, scaling, and algebraic concepts in Upper Key Stage 2.

Times Tables Progression

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	Experience of counting in 1, 2, 5, 10					
2	1x	(1x) 2x	5x	(5x) 10x	Revision	Revision
3	(2x) 4x	(4x) 8x	3x	(3x) 6x	(6x) 12x	Revision
4	9x	7x	11x	Squares	Revision	MTC
5	Consolidation and rapid application (applying facts to fractions, percentages and decimals)					
6						

Appendix A

<u>Calculation Policy Overview</u>

Mathematics equips pupils with a uniquely powerful set of tools to understand and adapt to change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways.

The ability to calculate is a fundamental skill not only for school but for the pupils to use throughout their adults lives. It is, therefore, essential that all pupils leave Key Stage Two being able to use the most efficient mental and written calculations strategies possible. This policy outlines the development of these skills through the use of concrete and pictorial representations into the abstract representations needed to calculate with larger numbers.

At the heart of the policy, is the importance that the pupils have a deep understanding of number and calculations rather than the ability to follow a process.

The CPA Framework

- **Concrete:** Hands-on manipulation of physical objects (e.g., counters, Base 10, Numicon).
- **Pictorial:** Visual representations of the concrete objects (e.g., bar models, part-whole models, drawing tallies).
- **Abstract:** Using standard numerical symbols and formal written methods (e.g., $12 + 5 = 17$, long multiplication).

Addition

Early Years & Key Stage 1 (EYFS – Year 2)

Focuses on aggregation (combining two groups) and augmentation (adding on to an existing group).

Strategy	Concrete	Pictorial	Abstract
Part-Whole Model	Combining two groups of physical objects into one whole.	Drawing circles/counters inside a part-whole blank template.	$3 + 5 = 8$ $8 - 3 = 5$
Regrouping to make 10	Using a 10-frame and counters to build the first number, then filling the 10-frame to bridge 10.	Drawing counters on a 10-frame showing the shift to make a full ten.	$8 + 5$ $= 8 + 2$ $+ 3$ $10 + 3$ $= 13$
Adding Multiples of 10	Using Base 10 equipment (Rods and Cubes) to add tens to a two-digit number.	Drawing lines for tens and dots for ones to visually add the value.	$23 + 30$ $= 53$

Key Stage 2 (Year 3 – Year 6)

Progression moves toward formal column addition, transitioning from no exchange to exchanging across multiple columns.

- **Year 3/4 (Intro to Column Addition):** Students use place value counters on a grid to physically "exchange" 10 ones for 1 ten. Side-by-side, they write the abstract column method to link the action to the notation.
- **Year 5/6 (Decimals and Larger Numbers):** The same column method is used, utilizing place value counters/drawings to represent tenths and hundredths, ensuring alignment of the decimal point.

Subtraction

Early Years & Key Stage 1 (EYFS – Year 2)

Focuses on taking away (physically removing), counting back, and finding the difference (comparison).

Strategy	Concrete	Pictorial	Abstract
Taking Away	Physically removing items from a set or crossing them off a Numicon shape.	Drawing a group of objects and crossing out the number being subtracted.	$7 - 3 = 4$
Counting Back	Moving backward on a physical track or giant number line.	Using a drawn number line to show jumps backward.	$15 - 4 = 11$
Find the Difference	Arranging two rows of cubes next to each other to look at the gap.	Drawing a comparison bar model to highlight the difference.	The difference between 8 and 5 is 3.

Key Stage 2 (Year 3 – Year 6)

Progression moves from mental strategies to formal column subtraction involving exchanging.

- **Year 3/4 (Column Subtraction):** When subtracting a larger digit from a smaller one (e.g., $42 - 17$), students physically exchange a Concrete "10 rod" for ten "1 ones". Pictorially, they cross out a ten and draw ten ones in the next column.
- **Year 5/6 (Advanced Column Subtraction):** Extending to numbers beyond 4 digits and decimals. The emphasis shifts heavily to the **Abstract**, but **Pictorial** bar models are consistently used to unpack multi-step word problems.

<u>Multiplication</u>

Key Stage 1 (Year 1 – Year 2)

Focuses on doubling, counting in multiples, and recognizing equal groups.

Strategy	Concrete	Pictorial	Abstract
Equal Groups	Making physical groups of identical objects (e.g., 3 plates with 2 biscuits each).	Drawing equal groups or columns of items.	$2 + 2 + 2 = 6$ 3 groups of 2
Arrays	Arranging counters into neat rows and columns.	Drawing dots or X's in an array format to show commutativity.	$2 \times 4 = 8$ $4 \times 2 = 8$

Key Stage 2 (Year 3 – Year 6)

Progression moves from the grid method to short and long formal multiplication.

- **Year 3/4 (Grid Method to Short Multiplication):** * *Concrete:* Using Base 10 to fill an area model grid (e.g., 14×3).
    - *Pictorial:* Drawing the grid method with partitioned numbers (10 and 4 times 3).
    - *Abstract:* Shifting to formal short multiplication.
- **Year 5/6 (Long Multiplication):** Multiplying up to 4-digit numbers by a 2-digit number. Pictorially supported by area models to show why placeholders (0) are required when multiplying by the tens digit.

<u>Division</u>

Key Stage 1 (Year 1 – Year 2)

Focuses on sharing equally into groups, and grouping (finding how many groups of a certain size can be made).

Strategy	Concrete	Pictorial	Abstract
Sharing Equally	Sharing 12 counters one by one into 3 distinct hoops.	Drawing circles and distributing dots equally among them.	$12 \div 3 = 4$
Grouping	Taking 12 counters and putting them into clusters of 3 to see how many groups are made.	Grouping an array or set of drawn objects by circling sets of 3.	$12 \div 3 = 4$

Key Stage 2 (Year 3 – Year 6)

Progression moves from short division (bus stop) with remainders to formal long division.

- **Year 3/4 (Short Division - No Remainders):**
    - *Concrete:* Sharing place value counters into rows on a grid.
    - *Pictorial:* Drawing the counters and circling groups matching the divisor.
    - *Abstract:* Introducing the formal "bus stop" notation.
- **Year 5/6 (Short and Long Division with Remainders):**
    - Students interpret remainders as fractions, decimals, or by rounding up/down depending on context.
    - Long division utilizes a list of the divisor's multiples written down the side of the page (Abstract aid) to systematically subtract large chunks.

Implementation & Classroom Environment

1. **Manipulatives are accessible to all:** Concrete resources are not just for lower-attaining students; they are toolkits for structural clarity across all ability levels.
2. **Consistent Vocabulary:** Use precise language (e.g., *exchange* instead of *borrow*; *ones* instead of *units*).

3. **The "Why" Before the "How":** Never introduce an abstract trick (e.g., "just add a zero") without using pictorial or concrete representations to prove why the rule works.