Walnut Tree Walk Calculation Policy- Executive Summary

Intention:

The aim of this calculation policy, aligned with the White Rose policy, is to develop students' mathematical understanding and skills progressively. The focus is on ensuring pupils gain fluency, reasoning, and problem-solving abilities by:

- Promoting deep conceptual understanding through the Concrete – Pictorial – Abstract (CPA) progression model.
- Embedding a mastery approach that ensures thorough comprehension before moving on to new concepts.
- Encouraging equal emphasis on fluency, reasoning, and problem-solving, enabling students to calculate accurately, understand methods, and apply knowledge in varied contexts.

Implementation:

This is implemented through the CPA approach throughout all lessons across the school. Students will progress from manipulating physical objects (concrete) to visual representations (pictorial) and then to abstract number calculations. Teachers use resources like manipulatives, pictures and number sentences to scaffold learning, and lessons are delivered through small, mastery steps to ensure deep understanding. Teachers revisit and incorporate concepts regularly, to build fluency and confidence using 'flashbacks'. Teachers also use the Calculate, Apply, Think (CAT) Framework in all lessons. This framework aligns with White Rose's fluency, reasoning, and problem-solving focus:

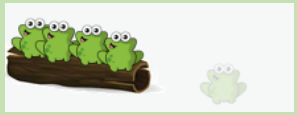
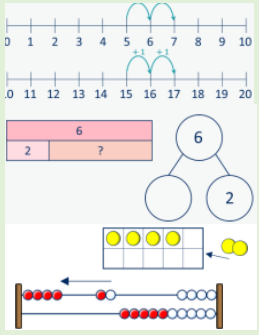
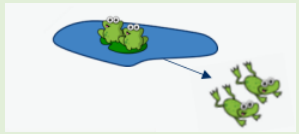
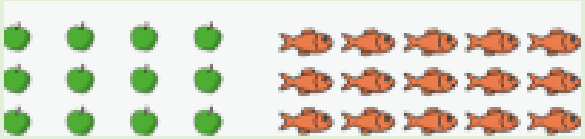
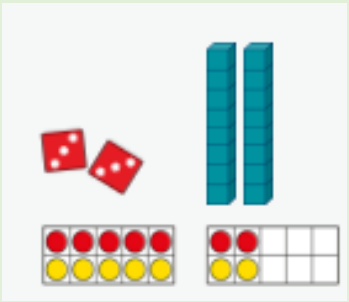
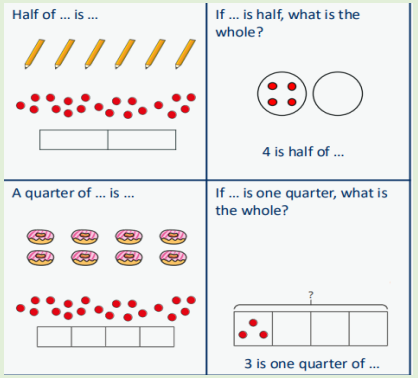
Calculate: Teaching efficient methods for accurate calculations and fluency.

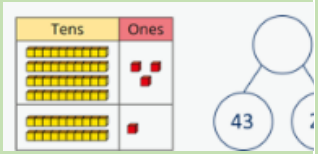
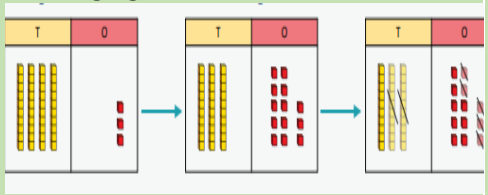
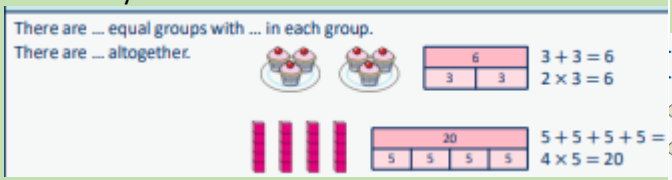
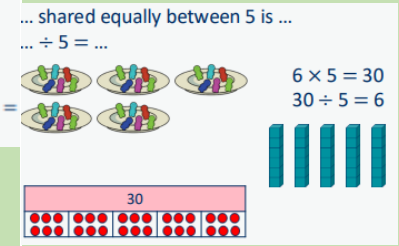
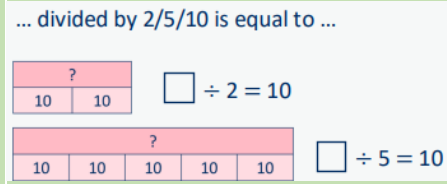
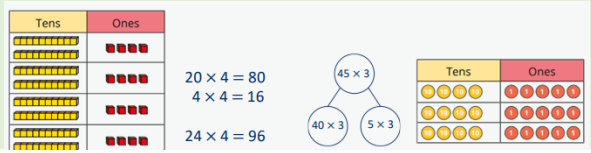
Apply: Students practice applying learned strategies to solve problems.

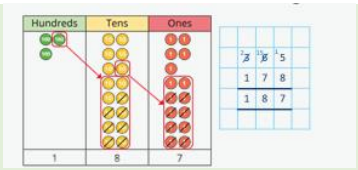
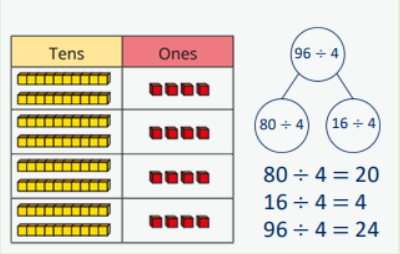
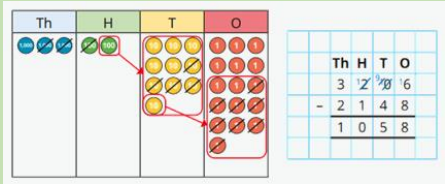
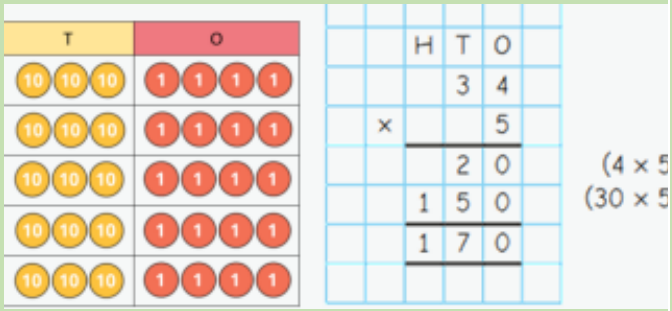
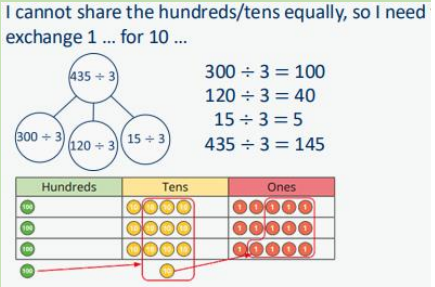
Think: Encouraging higher-order thinking and mathematical reasoning.

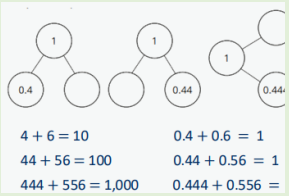
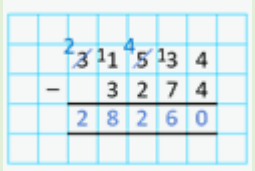
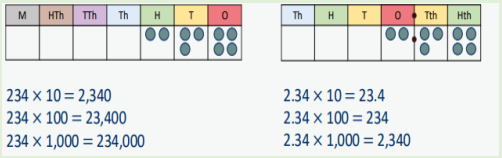
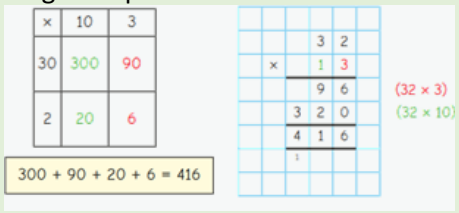
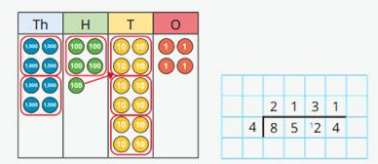
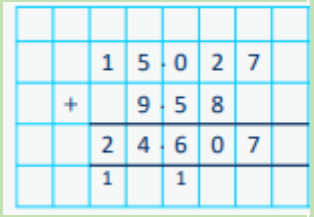
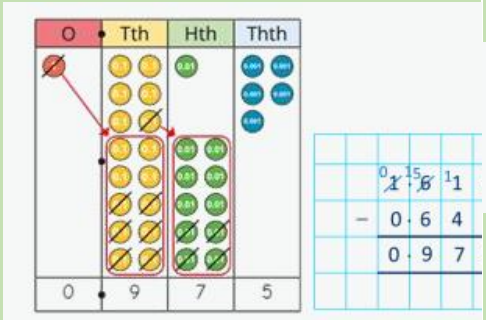
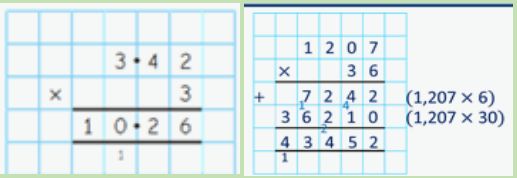
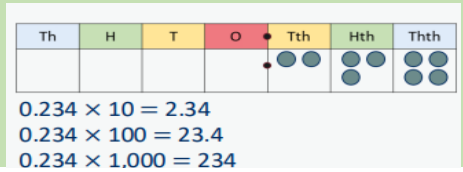
Impact:

The impact will be evidenced through students' demonstration of clear, measurable progression in their ability to calculate fluently, reason logically, and solve problems. The CPA approach ensures students develop strong foundations in mathematical concepts, and the mastery approach fosters confidence, as students build competence through deep understanding and regular practice. The CAT framework enables students to approach new problems independently and thoughtfully. By embedding fluency, reasoning, and problem-solving, pupils are better prepared for future mathematical challenges and applications in real life. The policy's structure ensures pupils consistently achieve or exceed expected outcomes in mathematics.

Year group	Addition	Subtraction	Multiplication	Division
EYFS	Counting objects, using fingers, and introducing number bonds to 5 and 10. Focus on one more and one less. 	Understanding subtraction as taking away using nursery rhymes. Using physical objects to subtract. 	Begin to double numbers up to 10 and make equal groups using manipulatives.  	Begin to share objects between groups practically (link to halving). Using stem sentences to secure understanding. 
Year 1	Counting on from a number, using number lines, Base 10s and rekenreks and introducing number bonds to 20. Make links to known facts using bar models and part-whole models. 	Subtract by counting back, using number lines and physical resources. 'First…then…now'  Recognising fact families. $6-2=4$ $6-4=2$ $4=6-2$ $2=6-4$	Begin to understand multiplication as repeated addition and arrays. Count in 2s, 5s, and 10s. Children use their knowledge of adding equal groups to arrange objects in columns and rows. Use Base 10s, counters and 10 frames to demonstrate doubles.  	Begin to understand division as sharing and grouping. Start using pictures and bar models. 

Year 2	Number bonds to 20, adding three, 1-digit numbers, adding 2-digit numbers with concrete resources, moving to exchange across ten. 	Subtract using number lines, 100 squares and Base 10s. Use column subtraction with and without exchanging. 	Develop understanding of 2, 5, and 10 times tables and arrays. Introduce mental multiplication. Link repeated addition and multiplication and models to demonstrate. Use stem sentences to emphasise the use of correct vocabulary. 	Understand division as grouping and sharing using arrays and practical methods. Dividing by 2, 10 and 5. Using bar models to show link between multiplication and division.  
Year 3	Add 3-digit numbers using formal written methods (column addition), beginning to exchange. Use mental methods for smaller numbers.	Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Formal written method (column) with up to 2 exchanges.	Understand and use 3, 4, and 8 times tables. Move to more formal methods of multiplication using portioning with bar models and pictorial representations and manipulatives in a place value chat. 	Use multiplication facts to divide by 3, 4 and 8. Divide a 2-digit number by a 1 digit number using partitioning.

				
Year 4	Add numbers with up to 4 digits using the column method for exchanging. Add decimals within the context of money using portioning and number lines to improve mental strategies. 	Subtract numbers with up to 4 digits using formal methods, including up to 3 exchanges. 	Multiply 2-digit or 3-digit number by a 1-digit number. Introduced by using the expanded written method, and then the short formal method. 	Divide a 2- or 3-digit number by a 1-digit number with some exchanges. Begin understanding remainders in different contexts using stem sentences. 

Year 5	Add numbers with more than 4 digits, including decimals, using the formal column method.  4 + 6 = 10 0.4 + 0.6 = 1 44 + 56 = 100 0.44 + 0.56 = 1 444 + 556 = 1,000 0.444 + 0.556 = Identify compliments to one using part whole models.	Subtract numbers with more than 4 digits, including decimals, using column subtraction and exchanging.   	Multiply integers and decimals by 10, 100 and 1000 using place value charts and moving the digits to the left.  234 × 10 = 2,340 234 × 100 = 23,400 234 × 1,000 = 234,000 2.34 × 10 = 23.4 2.34 × 100 = 234 2.34 × 1,000 = 2,340 Multiply 4-digit numbers by 1- and 2-digit numbers using the area model (grid method) and then formal, long multiplication.  	Use short and long division, interpreting remainders as fractions or decimals. 
Year 6	Confident use of column addition for large numbers up too 10 million, and decimals up to 3 decimal places. Develop efficiency with mental strategies. 	Subtract numbers up to 10 million confidently, focusing on accuracy with formal methods. Subtract decimals with up to 3 decimal places using column method.  	Multiply multi-digit numbers up to 4 digits by 2 digits using long multiplication. Multiply decimals by integers using formal written method. Multiply by 10, 100 and 100 by using Place Value and moving the digits to the left.  (1,207 × 6) (1,207 × 30)  	Use long division confidently using the DMSB method (divide, multiply, subtract bring down). Interpret remainders as whole numbers, fractions, or decimals depending on context.