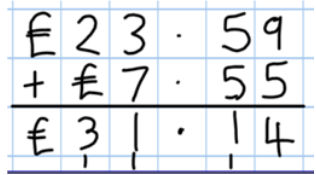


Addition

Calculation progression through the primary years

'Nobody else is quite like me'

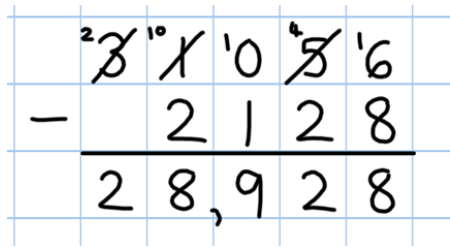
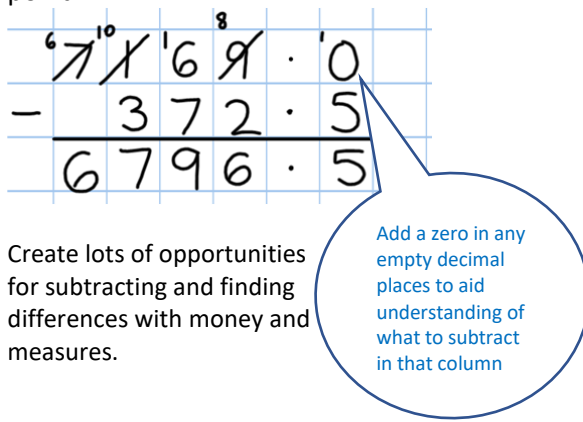
	Branches	Milestone 3	Method	Model/Examples
		Year 5		
Addition Year 5	Number Bonds		Mental methods should continue to develop, supported by a range of models and images, including the number line. Children should practise with increasingly large numbers to aid fluency	Continue to use the bar model as in Y4.
	Mental Calculations	add and subtract numbers mentally with increasingly large numbers		$2364 + 1999 =$ $2364 + 2000 = 4364$ $4364 - 1 = 4363$
	Written Methods	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Written methods (progressing to more than 4-digits) As year 4, progressing when understanding of the expanded method is secure, children will move on to the formal columnar method for whole numbers and decimal numbers as an efficient written algorithm.	$12462 + 2300 =$ $12462 + 2000 = 14462$ $14462 + 300 = 14762$
	Inverse operations, estimating and checking answers	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Place value counters can be used alongside the columnar method to develop understanding of addition with decimal numbers. The decimal point should be aligned in the same way as the other place value columns, and must be in the same column in the answer.	172.83 $+ 54.68$ $\underline{227.51}$ $1 \quad 1$
	Problem Solving	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Children using rounding to estimate answers	 $25.356 + 346.28$ becomes: Estimate: $25 + 350 = 375$
				25.356 $+346.28$ $\underline{371.636}$ $1 \quad 1$

'Nobody else is quite like me'

Subtraction

Calculation progression through the primary years

'Nobody else is quite like me'

	Branches	Milestone 3	Method	Model/Examples
		Year 5		
Subtraction Year 5	Number Bonds		Missing number/digit problems	$6.45 = 6 + 0.4 + \square$; $119 - \square = 86$; $1\,000\,000 - \square = 999\,000$; $600\,000 + \square + 1000 = 671\,000$; $12\,462 - 2\,300 = \square$
	Mental Calculations	add and subtract numbers mentally with increasingly large numbers	Mental methods should continue to develop, supported by a range of models and images, including the number line.	
	Written Methods	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Written methods (progressing to more than 4-digits) When understanding of the expanded method is secure, children will move on to the formal method of decomposition, which can be initially modelled with place value counters.	Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point.
	Inverse operations, estimating and checking answers	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Progress to calculating with decimals, including those with different numbers of decimal places.	
	Problem Solving	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why		Create lots of opportunities for subtracting and finding differences with money and measures.

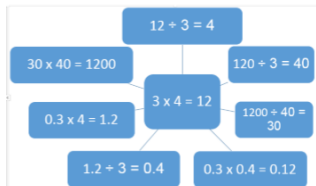


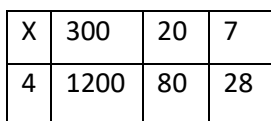

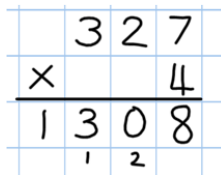
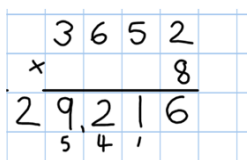
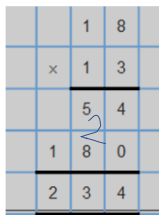
'Nobody else is quite like me'

Multiplication

Calculation progression through the primary years

'Nobody else is quite like me'

Multiplication Year 5

	Branches	Milestone 3 Year 5	Method	Models/Examples
Multiplication Year 5	Multiplication and division facts	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value)	Mental methods Solving practical problems where children need to scale up. Relate to known number facts.	$4 \times 35 = 2 \times 2 \times 35$  $1 \times 1 = 1^2$ $2 \times 2 = 2^2$ $3 \times 3 = 3^2$ $1 \times 1 \times 1 = 1^3$ $2 \times 2 \times 2 = 2^3$ $3 \times 3 \times 3 = 3^3$  
	Mental Calculations	multiply and divide numbers mentally drawing upon known facts multiply and divide whole numbers and those involving decimals by 10, 100 and 1000		
	Written Methods	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	Written methods Continue with the grid method for multiplication from Year 4 progressing to short multiplication when children are ready. Children to compare these to see how the steps are related.	  
		divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context		
	Properties of numbers: Multiples, Factors, Prime, Square, cube numbers	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Once children are confident with HTU x U they are to progress to more complex numbers.	Moving towards more complex numbers   <div>18 x 3 on the 1st row (8 x 3 = 24, carrying the 2 for twenty, then '1' x 3). 18 x 10 on the 2nd row. Put a</div>
		know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers		
		establish whether a number up to 100 is prime and recall prime numbers up to 19		
		recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)		
	Order of Operations			
	Inverse operations, estimating and checking answers			
Problem Solving	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	Progress to long multiplication when children are confident with their place value and with carrying numbers into next columns.		
	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign			
	solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates			

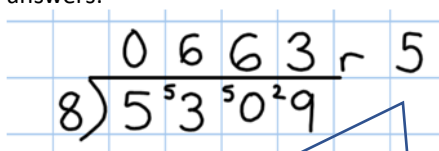
'Nobody else is quite like me'

Division

Calculation progression through the primary years

'Nobody else is quite like me'

Division Year 5

	Branches	Milestone 3	Method	Models/Examples
		Year 5		
Division Year 5	Multiplication and division facts	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value)	\div = signs and missing numbers Continue using a range of equations but with appropriate numbers	Using x = signs and missing numbers $630 \div \square = 9$ $\square \div 9 = 0.7$ $\square \div \Delta = 63$ $\Delta \div 90 = 70$ Balanced equations $100 \div \circ = \Delta \div 2$
	Mental Calculations	multiply and divide numbers mentally drawing upon known facts	Formal Written Method for Division Continued as shown in Year 4, leading to the efficient use of the formal method.	Divide up to 4 digits by a single digit, including those with remainders. Short division, including remainder answers:  <div data-bbox="1720 660 2152 786" style="border: 1px solid blue; padding: 5px; margin-top: 5px;">The answer to $5309 \div 8$ could be expressed as 663 and five eighths, 663 r 5, as a decimal, or rounded as</div>
	Written Methods	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers		
		divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	Children should progress in their use of written division calculations (chunking) As children become more confident with HTU \div U they can progress to the written method for dividing a 3 digit number by a 2 digit number, HTU \div TU	
	Properties of numbers: Multiples, Factors, Prime, Square, cube numbers	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Quotients should be expressed as decimals and fractions Children begin to practically develop their understanding of how express the remainder as a decimal or a fraction. Ensure practical understanding allows children to work through this (e.g. what could I do with this remaining 1? How could I share this between 6 as well?)	
		know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers		
		establish whether a number up to 100 is prime and recall prime numbers up to 19		
		recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)		
	Order of Operations			
	Inverse operations, estimating and checking answers			
	Problem Solving	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes		
		solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign		
		solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates		