Whole School progression multiplication and division

	YR	Year 1	Year 2 TAF - bold	Year 3	Year 4	Year 5	Year 6
Mental Calculations			To begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. To begin to relate multiplication and division facts to fractions and measures (*e.g., 40 ÷ 2 = 20, 20 is a half of 40).* To show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot, to develop multiplicative reasoning.	To write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using *efficient* mental *methods, for example, using commutativity and associativity,* and progressing to formal *reliable* written methods *of short multiplication and division.*	To combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations, *e.g. 2 x 6 x 5 = 10 x 6 = 60.* To practise mental methods and extend this to three-digit numbers to derive associative facts, (e.g. 600 ÷ 3 = 200 can be derived from 2 x 3 = 6). To recognise and use factor pairs and commutativity in mental calculations. To use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.	To multiply and divide numbers mentally drawing upon known facts.	To perform mental calculations, including with mixed operations and large numbers.
Multiplication and division facts		To make connections between arrays, number patterns, and counting in	To use a variety of language to describe	To recall and use multiplication and division facts for the 3, 4 and 8 multiplication	To recall multiplication and division facts for multiplication	To apply all the multiplication tables and related division facts frequently, commit	To continue to use all the multiplication tables to calculate

		twos, fives and tens. Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.	multiplication and division. To count from 0 in multiples of 4, 8, 50 and 100. To recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers **and use them to solve simple problems, demonstrating an understanding of commutativity as necessary.** *To connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.*	tables when they are calculating mathematical statements in order to improve fluency. To connect the 2, 4 and 8 multiplication tables through doubling	tables up to 12 × 12 *to aid fluency.* *To write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)).*	them to memory and use them confidently to make larger calculations.	mathematical statements in order to maintain their fluency.

Written Calculations			To calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. To begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.	To write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using *efficient* mental *methods,* for example, using commutativity and associativity, and progressing to formal reliable written methods of short multiplication and division. (included in mental calculation section)	To multiply two-digit and three-digit numbers by a one-digit number using the formal written layout of short multiplication with exact answers. To become fluent in the formal written method of short division with exact answers.	To multiply numbers up to four digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers fluently. To divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context fluently. To multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	To multiply multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication. To divide numbers up to four digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. To divide numbers up to four digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. Perform mental calculations, including with mixed operations and large numbers.

Properties of numbers						To use and understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements. To identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. To know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. To establish whether a number up to 100 is prime and recall prime numbers up to 19. To recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).	To identify common factors, common multiples and prime numbers.

Order of operations							To use their knowledge of the order of operations to carry out calculations involving the four operations.
Solve problems		To solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	To solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	To solve *simple* problems *in contexts, deciding which of the four operations to use and why.* These include missing number problems, involving multiplication and division, including *measuring* and positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	To solve two-step problems in contexts involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems, such as n objects are connected to m objects.	To solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. To solve problems, *including in missing number problems,* involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign *(to indicate equivalence).* To solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	To solve problems involving addition, subtraction, multiplication and division. To use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

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