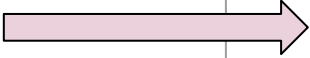# Multiplication and Division

Progression of Skills:
- Multiplication and Division Facts
- Mental Calculations
- Written Calculation
- Properties of Numbers: Multiples, Factors, Primes, Square and Cube Numbers
- Order of Operations
- Inverse Operations, Estimating and Checking Answers
- Problem Solving

Multiplication and Division Facts

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. <u>Ongoing in weekly arithmetic</u>	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	Recall and use multiplication and division facts for multiplication tables up to 12 x 12 <u>Ongoing in weekly arithmetic</u>	*Build on year 4 to ensure mastery.*	

Mental Calculation

	Year 2	Year 3	Year 4	Year 5	Year 6
	Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. <u>Ongoing in weekly arithmetic</u>	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 mental methods.	Use place value, known and derived facts to multiply and divide numbers mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.	Multiply and divide numbers mentally drawing upon known facts.	Perform mental calculations, including with mixed operations and large numbers.
			Recognise and use factor pairs and commutativity in mental calculations.	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	*Build on year 5 to ensure mastery.*

Written Calculation					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs. <u>Ongoing in weekly arithmetic</u>	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 mental methods and progressing to formal written methods.	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. <u>Ongoing in weekly arithmetic</u>	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.	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
				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.	Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 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.

Order of Operations					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Use their knowledge of the order of operations to carry out calculations involving the four operations.
Inverse Operations, Estimating and Checking Answers					
		Estimate the answer to a calculation and use inverse operations to check answers. Ongoing in weekly arithmetic	Estimate and use inverse operations to check answers to a calculation. Ongoing in weekly arithmetic		Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Properties of Numbers: Multiples, Factors, Primes, Square and Cube Numbers					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Recognise and use factor pairs and commutativity in mental calculations.	Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers.	Identify common factors, common multiples and prime numbers.
				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).	Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3) and extending to other units such as mm3 and km3.

Problem Solving					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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.	Solve problems involving multiplication and division using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts. <u>Ongoing in weekly arithmetic</u>	Solve problems including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	Solve problems 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. <u>Ongoing in weekly arithmetic</u>	Solve problems involving multiplication and division including their knowledge of factors and multiples, squares and cubes.	Solve problems involving addition, subtraction, multiplication and division.
				Solve problems involving addition and 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.	Solve problems involving similar shapes where the scale factor is known or can be found.