Mathematics Key Learning – Multiplication & Division

'Working together to achieve success'

Statements taken from the National Curriculum 2014

Additional statements to support progression in learning.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MULTIPLICATION & DIVISION FACTS					
count in multiples of twos, fives and tens (copied from Number and Place Value)	**count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward** (copied from Number and Place Value)	**count from 0 in multiples of 4, 8, 50 and 100** (copied from Number and Place Value)	**count in multiples of 6, 7, 9, 25 and 1 000** (copied from Number and Place Value)	**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)	*Use partitioning to double or halve a number.*
Recall and use doubles of all numbers to 10 and corresponding halves.	**recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers**	**recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables**	**recall multiplication and division facts for multiplication tables up to 12 × 12**	*Use partitioning to double or halve any number, including decimals, to two decimal places.*	*Multiply one digit numbers with up to two decimal places by whole numbers.*
	Derive and use doubles of simple 2 digit numbers (numbers in which the ones total less than 10)	*Derive and use doubles of all multiples of 50 to 500.*	*Use partitioning to double or halve any number, including decimals to one decimal place.*		
	Derive and use halves of simple 2 digit even numbers (numbers in which the tens are even)				
MENTAL CALCULATION					
		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 and progressing to formal written methods (appears also in Written Methods)	**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**	**multiply and divide numbers mentally drawing upon known facts**	**perform mental calculations, including with mixed operations and large numbers**
	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		**recognise and use factor pairs and commutativity in mental calculations** (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	**associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ³/₈)** (copied from Fractions)
WRITTEN CALCULATION					
	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	**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 and progressing to formal written methods** (appears also in Mental Methods)	**multiply two-digit and three-digit numbers by a one-digit number using formal written layout**	**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**
	Understand multiplication as repeated addition.	*Understand how multiplication and division statements can be represented using arrays.*	*Divide numbers up to 3 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 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**
		Understand division as sharing and grouping.			**use written division methods in cases where the answer has up to two decimal places** (copied from Fractions (including decimals))

					Use written division methods in cases where the answer has up to 2 decimal places.

PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS					
			recognise and use factor pairs and commutativity in mental calculations (repeated)	**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	*use common factors to simplify fractions; use common multiples to express fractions in the same denomination* (copied from Fractions)
				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 (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3* (copied from Measures)
				Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	
				Know and use the vocabulary of prime numbers, prime factors and composite (no-prime) numbers.	
				Establish whether a number up to 100 is prime and recall prime numbers up to 19.	

ORDER OF OPERATIONS					
					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 (copied from Addition and Subtraction)	***estimate and use inverse operations to check answers to a calculation*** (copied from Addition and Subtraction)	*Use estimation and inverse to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.*	**use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy**
		Use estimation to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.	*Use estimation and inverse to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.*		*Use estimation and inverse to check answers to calculations and determine, in the context of the problem, an appropriate degree of accuracy.*
		Understand that division is the inverse of multiplication and vice versa.			

PROBLEM SOLVING					
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**	**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**	**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** *including ones with missing numbers*.
	Understand division as sharing and grouping and that a division calculation can have a remainder.	*Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)*	*Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known*	**solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign**	*Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known*

				<em style="color:red">fact, calculate mentally, use a jotting, written method)
			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*** **(copied from Ratio and Proportion)**
			Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)	

VOCABULARY				
add, addition, repeated addition, multiplication, multiply, lots of, groups of, times, double, array, row, column, rectangle, count in…, number pattern, multiple, twice, three times, four times… as long/wide/heavy/much etc, divide, division, equal sharing, subtract, subtraction, repeated subtraction, equal grouping, lots of, groups of, halve, array, row, column, rectangle, count in…, number pattern	number, count (on, back, to, from), units, ones, twos, threes, fives, tens, exchange, digit, place, place value, represents, equal to, repeated addition, array, row, column, lots of, groups of, times, …times as long/wide/tall/heavy/much, multiply, multiplied by, multiple of, sequence, continue, predict, rule, sort, group, set, diagram, table, equal groups of, divide, divided by, divided into, share (equally), how many… in…?, left (over), remainder, halve	count (on, up, back, down), sequence, step, continue, predict, multiple, multiplication, multiply, lots of, groups of, product, repeated addition, array, … times as … (e.g. 3 times as long), scale up, estimate, efficient, division, inverse, lots of, groups of, array, row, column, share equally, group in …, equal groups of, divide, divided by, divided into, left (over), remainder, estimate, efficient, partition	lots of, groups of, times, multiply, multiplication, multiplied by multiple of, product, repeated addition, array, row, column, double, halve, half, equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by, inverse, partition, ones, tens, hundreds, thousands, place, place value, digit, inverse, dividend, divisor, partition, ones, tens, hundreds, thousands, place, place value, digit, next, consecutive, sequence, continue, predict, pattern, rule, relationship, increase, decrease,	lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, times as (big, long, wide… and so on), repeated addition, array, row, column, double, halve, share between, share into groups of , group in pairs, threes… tens, equal groups of, divide, division, divided by, divided into, remainder, factor, divisible by, inverse, prime, square number, share, share equally, equal groups of, divide, division, divided by, divided into, remainder, chunking, repeated subtraction, product, twice, three times… ten times…, times as (big, long, wide… and so on), repeated addition, array, row, column, factor, square number, cube number, factor, common factor, fraction, rate	lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times……… ten times as (big, long, wide etc.) inverse, sharing, equally, divide, division, divisor, quotient, factor, divisible, inverse, remainder, rounding, short division (division by a single digit number), long division (division by a number with more than one digit), finding all possibilities, variables, enumerate, combinations, systematic, organised, pattern, starting point, generalise