

# Number: Multiplication and

## Division

Progression of multiplication and division facts.					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Progression of knowledge					
<p>To count in multiples of twos, fives and tens.</p> <p>(copied from Number and Place Value)</p> <p>To count forwards and backwards in twos.</p> <p>To count forwards and backwards in tens.</p> <p>To count forwards and backwards in fives.</p>	<p>To count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward.</p> <p>(copied from Number and Place Value)</p>	<p>To count from 0 in multiples of 4, 8, 50 and 100</p> <p>To recall their multiples of 10.</p> <p>(copied from Number and Place Value)</p>	<p>To count in multiples of 6, 7, 9, 25 and 1 000</p> <p>(copied from Number and Place Value)</p>	<p>To count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</p> <p>To recall the prime numbers up to 19.</p> <p>(copied from Number and Place Value)</p>	<p>To recall the prime numbers up to 19.</p>
<p>To recognize equal groups.</p> <p>To describe given arrays and build arrays using repeated addition sentences to describe them.</p> <p>To describe doubles as two equal groups.</p>	<p>To recognise and make equal groups</p> <p>To know that multiplication is commutative</p> <p>To understand the difference between the sharing and grouping structures of division.</p>	<p>To revisit and consolidate making equal groups (from Y2)</p> <p>To build and use arrays to enhance their knowledge of the link between repeated addition and multiplication and to explore commutativity.</p>	<p>To multiply by 6</p> <p>To divide by 6</p> <p>To know that the 6 times table is double the 3 times table.</p> <p>To multiply by 9</p> <p>To divide by 9.</p>		

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<p>To start with a given total and make equal groups of the same amount.</p> <p>To share objects into groups.</p>	<p>To explore the 2x table in a range of ways using multiple representations.</p> <p>To divide by 2.</p> <p>To double and halve numbers.</p> <p>To recognise odd and even numbers and know that when a number is even it can be halved into a whole number answer.</p> <p>To explore the 10x table in a range of ways using multiple representations.</p> <p>To divide by 10.</p> <p>To explore the 5x table in a range of ways using multiple representations.</p> <p>To divide by 5.</p> <p><b>Recall and use multiplication and division facts for the</b></p>	<p>To know that multiples of 2 are numbers that can be divided into two equal groups.</p> <p>To revisit and consolidate learning of sharing and grouping ( from Y2)</p> <p>To divide by 3 using both sharing and grouping strategies.</p> <p>To multiply by 4.</p> <p>To explore dividing by 4 through sharing into 4 equal groups and grouping into 4s.</p> <p>To multiply by 8.</p> <p>To explore dividing by 8 through sharing into 8 equal groups and grouping into 8s.</p> <p><b>Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</b></p>	<p>To multiply by 7</p> <p>To divide by 7</p> <p>To multiply by 11</p> <p>To divide by 11</p> <p>To multiply by 12</p> <p>To divide by 12</p> <p>To know that when a number is multiplied by 1, the result will always be the number itself.</p> <p>To know that when multiplying any number by zero the result is always zero.</p> <p>To divide a number by 1 and itself.</p> <p>To know that it does not matter how they group the numbers when they multiply ( multiplying three numbers)</p> <p><b>Recall multiplication and</b></p>		
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	2, 5 and 10 multiplication tables, including recognising odd and even numbers		division facts for multiplication tables up to $12 \times 12$		
<b>Mental Calculation Progression</b>					
		<p>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 mental and progressing to formal written methods</p> <p>To know how to scale facts by 10.  <math>3 \times 4 = 12</math> so <math>3 \times 40 = 120</math> and <math>30 \times 4 = 120</math>.</p> <p>To use facts by unitising in tens, for example using <math>8 \div 2 = 4</math> to derive <math>8 \text{ tens} \div 2 = 4 \text{ tens}</math>, so <math>80 \div 2 = 40</math>.</p> <p>(appears also in Written Methods)</p>	<p>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</p> <p>To know that 'ten times the size' is the same as multiplying by ten.</p> <p>To know that when multiplying by 10 the digits move one place value column to the left and zero is needed as a placeholder in the now blank column.</p> <p>To multiply whole</p>	<p>multiply and divide numbers mentally drawing upon known facts</p> <p>To know that the effect of multiplying by 10 twice is the same as multiplying by 100</p> <p>To know that multiplying by 10 three times is the same as multiplying by 1,000.</p> <p>To know that dividing by 10 twice is the same as dividing by 100 and that dividing by 10 three times is the same as dividing by 1,000.</p>	<p>perform mental calculations, including with mixed operations and large numbers</p>

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			<p>numbers by 100, understanding that this is the same as multiplying by 10 and then multiplying by 10 again</p> <p>To know that when multiplying whole numbers by 100, the digits move two place value columns to the left and zeros are needed as placeholders in the now blank columns.</p> <p>To know that making a number one-tenth the size is the same as "dividing by 10".</p> <p>To know that when dividing by 10, the digits move one place value column to the right.</p> <p>To know that making a number one-hundredth the size</p>		
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			<p>is the same as "dividing by 100".</p> <p>To know that when dividing by 100, the digits move two place value columns to the right.</p> <p>To use scaling facts by 10 and 100 for division and multiplication, for example using the fact that <math>4 \times 7 = 28</math> to derive <math>4 \times 70 = 280</math> and <math>4 \times 700 = 2,800</math>. <math>12 \div 3 = 4</math> to derive <math>120 \div 3 = 40</math> and <math>1,200 \div 3 = 400</math>.</p>		
<b>Properties of Number: Multiples, factors, primes, squared and cubed numbers.</b>					
		<p>To identify whether a number is a multiple of 2 or not.</p> <p>To know whether a number is a multiple of 5 or 10.</p> <p>To calculate in multiples of 3.</p>	<p>To know that a multiple of a number is any number that is in its times-table.</p> <p>To know the multiples of 3 in a range of contexts.</p> <p>To know how to recognise if a</p>	<p>To know that a multiple is the result of multiplying a number by a positive integer.</p> <p>To know how to find common multiples of a pair of numbers.</p>	<p>To know how to find the complete list of factors of a number and common multiples of a pair of numbers.</p> <p>To know how to find common</p>

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			<p>number is a multiple of 3 by finding its digit sum.</p> <p>To know that when two whole numbers are multiplied together to give a product, both the numbers that they multiplied together are factors of the product.</p> <p>To be able to find factor pairs of a number.</p> <p>To know that a factor of a number is a whole number that divides into it exactly.</p>	<p>To know the difference between what a factor is and what a multiple is</p> <p>To know that common factors are factors that are shared by two or more numbers.</p> <p>To know that numbers with exactly two factors are called prime numbers.</p> <p>To know that numbers with more than two factors are called composite numbers.</p> <p>To identify the prime factors of numbers.</p> <p>To know that square numbers are the result of multiplying a number by itself</p> <p>To recognise the square numbers up to <math>12 \times 12</math>.</p> <p>To know that ( <sup>2</sup> ) is the notation for squared numbers.</p>	<p>multiples of two or more numbers</p> <p>To know the rules of divisibility.</p> <p>To know that a number is prime when it has exactly two factors: 1 and itself.</p> <p>To know the prime factors of a given number</p> <p>To identify all the primes less than 100.</p>
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				<p>To know that a cube number is the result of multiplying a whole number by itself and then by itself again.</p> <p>To know that (<sup>3</sup>) is the notation for cubed numbers.</p>	
<b>Written Calculation progression ( see calculation policy)</b>					
<p>Writing number sentences using repeated addition to represent adding equal groups.</p> <p>Writing number sentences using repeated addition to represent arrays.</p> <p>Writing number sentences to represent repeated addition to represent doubles in the abstract.</p>	<p>Writing number sentences using repeated addition.</p> <p>To find the total using repeated addition</p> <p>To recognise the multiplication symbol and write a multiplication sentence.</p> <p>To recognise the division symbol and</p>	<p>To multiply 2 digit number by 1 digit without using an exchange ( expanded method) (Place value counters and place value chart)</p> <p>To multiply 2 digit number by 1 digit with an exchange ( expanded method- place value counters and place value chart)</p>	<p>Multiply a 2 digit number by a 1 digit number – formal multiplication.</p> <p>Multiply a 3 digit number by a digit number – formal multiplication</p> <p>Divide a 2 digit number by a 1 digit number (place value counters and PV chart)</p>	<p>Multiply a 4 digit number by a 1 digit number – short multiplication</p> <p>Multiply a 4 digit number by a 2 digit number (area model progressing to long multiplication)</p> <p>Multiplying a 3 digit and a 4 digit number by a 2 digit number – long multiplication</p>	<p>Multiplying a 4 digit number by a 2 digit number - long multiplication</p> <p>Short division using the formal method – 4 digit by one digit and including remainders.</p> <p>Long division – 4 digits divided by 2 digits including remainders</p>

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	write a division sentence.	To divide a two digit number by a 1 digit number without an exchange (place value counters and place value charts)  To divide a two digit number by a 1 digit number including remainders( place value counters and place value charts)	Divide a 3 digit number by a 1 digit number ( place value counters and PV chart)	Short division using the formal method – 4 digit by one digit and including remainders.	Interpreting the remainders in a rounding context, decimals and fractions.
<b>Key Representations progression – see calculation policy.</b>					
Number lines Number square 1-50 Tens frames Bead strings Counters	Arrays Counters Number line/ number tracks Bar model Base ten Number square 1-50	Multiple representations to support conceptual understanding of the 3s, 4s and 8s- arrays, number line, number track, hundred square, counters, cubes.  Base ten  Place value counters and Place value charts to support multiplying a 2 digit	Multiple representations to support conceptual understanding of the 6s, 7s, 9s, 11, 12s- arrays, number line, number track, hundred square, counters, cubes  Place value counters and place value charts to support understanding of multiplying and dividing by 10 and 100.	Arrays Tables and sorting diagrams Counters Cubes  Place value charts and counters to support multiplying and dividing by 10, 100 and 1000.  Place value counters and place value chart to support multiplying 4 digits by a 1 digit number.	Short multiplication – formal method  Long multiplication – formal method  Short division – formal method  Long division- base ten to support conceptual understanding  Long division – formal method.



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		<p>number by a 1 digit number.</p> <p>Place value counters and place value chart and Part whole models to support division 2 digit number by a 1 digit number.</p> <p>bar models for scaling.</p>	<p>Place value counters and place value charts to support understanding of multiplying 2 and 3 digit numbers by 1 digit</p> <p>Place value counters and place value charts and part whole model to support division 2 and 3 digit number by a 1 digit number.</p>	<p>Area model – using base ten or place value counters.</p> <p>Long multiplication</p> <p>Place value counters and place value chart to support short division</p> <p>Short division – formal method.</p>	
<b>Order of Operations</b>					
					<p>use their knowledge of the order of operations to carry out calculations involving the four operations</p>
<b>Key Vocabulary</b>					
<p>Groups of, equal groups, unequal groups, total, array, columns, rows, double, sharing,</p>	<p>repeated addition, multiply, total, times, multiplied by, multiplication, lots of, commutative,</p>	<p>Equal, arrays, lots of, multiples, sharing, grouping, altogether, flexible partitioning,</p>	<p>Multiples, sum of the digits, values, fact families, doubles, equal to, groups of, derive,</p>	<p>Multiples, divisible, common multiples, systematically, common factors, products,</p>	<p>Integers, Long division, order of operations,</p>

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<p>grouping, halving, pairs, forwards, backwards,</p> <p>___ groups of ten are equal to ___</p> <p>There are ___ equal groups of 5. There are ___ altogether.</p> <p>"There are ___ groups of ___ in ___."</p> <p>There are ___ counters shared equally into ___ groups.</p> <p>There are ___ in each group.</p>	<p>arrays, rows, columns,</p> <p>multiplication symbol (x) 2 times table, 5 times table, 10 times table, division symbol (<math>\div</math>) grouping, sharing, doubling, halving, odd, even,</p>	<p>inverse, fact families, commutative,</p> <p>Lots of, increase, decrease, greater than, less than,</p> <p>product, partition, exchange, expanded method, tens, ones, division facts, part whole, remainder, "times the size of" scaling, value,</p>	<p>facts, known facts, unknown facts, lots of, partition, groups of, sharing, doubles, zero, product, factor pairs, ten times the size</p> <p>1 ten is 10 times the size of 1 one and 1 hundred is 10 times the size of 1 ten, place holder, 100 times the size, one-tenth the size, one-hundredth the size, ones, tens, hundreds, thousands, partitioned, Short multiplication exchange, divisible, share, remainders,</p>	<p>prime numbers, composite numbers, prime factors, squared numbers (<math>^2</math>) cubed number (<math>^3</math>) divisibility, long multiplication 10 times the size of, 100 times the size of, 1000 times the size of</p> <p>Inverse</p> <p>One-tenth the size of</p> <p>One-hundredth the size of</p> <p>One thousandth the size of</p> <p>Exchange, tens, ones, hundreds, thousands</p> <p>Area model</p> <p>Product</p> <p>Long multiplication</p> <p>Short multiplication</p>	<p>BIDMAS, brackets, indices,</p>
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### Ready to Progress Criteria

<p><b>1NF-2</b> Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any</p>	<p><b>2MD-1</b> Recognise repeated addition contexts, representing them with multiplication equations and calculating the</p>	<p><b>3NF-2</b> Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables,</p>	<p><b>4NF-1</b> Recall multiplication and division facts up to <math>12 \times 12</math> and recognise products in multiplication tables as multiples of</p>	<p><b>5NF-1</b> Secure fluency in multiplication table facts, and corresponding division facts, through continued practice</p>	<p><b>6AS/MD-1</b> Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and</p>
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<p>multiple, and count forwards and backwards through the odd numbers.</p>	<p>product, within the 2, 5 and 10 multiplication tables.</p> <p><b>2MD-2</b> Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).</p>	<p>and recognise products in these multiplication tables as multiples of the corresponding number.</p> <p><b>3NF-3</b> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).</p> <p><b>3MD-1</b> Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.</p>	<p>the corresponding number.</p> <p><b>4NF-2</b> Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.</p> <p><b>4NF-3</b> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100).</p> <p><b>4MD-1</b> Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.</p> <p><b>4MD-2</b> Manipulate multiplication and division equations,</p>	<p><b>5NF-2</b> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).</p> <p>5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.</p> <p>5MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.</p> <p>5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written</p>	<p>(multiplicative relationships multiplicative relationships restricted to multiplication by a whole number).</p> <p><b>6AS/MD-2</b> Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding</p> <p><b>6NPV-1</b> Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth,</p>
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			<p>and understand and apply the commutative property of multiplication.</p> <p><b>4MD-3</b> Understand and apply the distributive property of multiplication.</p> <p>4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100</p>	<p>method.</p> <p>5MD-4 Divide a number with up to 4 digits by a onedigit number using a formal written method, and interpret remainders appropriately for the context.</p>	<p>1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).</p> <p><b>6NPV-4</b> Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p>
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