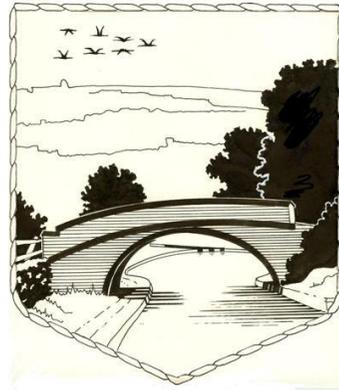


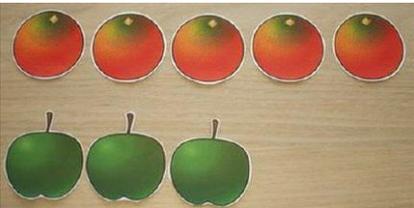
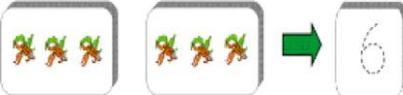
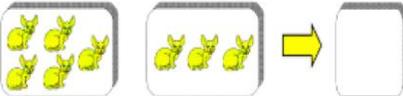
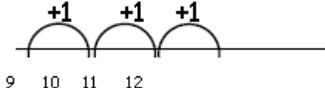
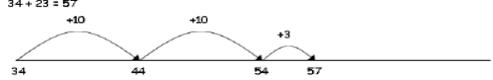
# St Lawrence CE (VA) Primary School



## Calculation Policy

*Reviewed by Steve Delaney Sept 2015  
(In line with the National Curriculum 2014)*

# Addition

Foundation stage	Year 1	Year 2	Year 3
<p>Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.</p>	<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p>	<p>Solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> <li>- using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>- applying their increasing knowledge of mental and written methods</li> </ul>	<p>Add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> <li>- a three-digit number and ones</li> <li>- a three-digit number and tens</li> <li>- a three-digit number and hundreds</li> </ul>
<p>Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.</p>     <p>Bead strings or bead frames can be used to illustrate addition.</p> $8 + 2 = 10$ 	<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Add and subtract one-digit and two-digit numbers to 20, including zero</p> <p>Bead strings or bead frames can be used to illustrate addition.</p> $8 + 5 = 13$  <p>Children then begin to use numbered lines to support their own calculations using a numbered line to count on in ones.</p> $9 + 3 = 12$ 	<p>Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>Add and subtract numbers using concrete objects, e.g. Numicon, bead string, base 10, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> <li>- a two-digit number and ones</li> <li>- a two-digit number and tens</li> <li>- two two-digit numbers</li> <li>- adding three one-digit numbers</li> </ul> <p>First counting on in tens and ones. Then helping children to become more efficient by adding the units in one jump (by using the known fact <math>4 + 3 = 7</math>).</p> $34 + 23 = 57$  <p>Followed by adding the tens in one jump and the units in one jump.</p> $34 + 23 = 57$  <p>Compensation - overjumping</p> $49 + 73 = 122$  <p>Partitioning</p> $37 + 24 = 30 + 7 + 20 + 4 = 50 + 11 = 61$	<p>Estimate the answer to a calculation and use inverse operations to check answers</p> <p>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p> $789 + 642 = 1431$

	<p>Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math>.</p> <p>Use balancing scales <math>7 + \square = 14</math></p>	<p>Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot <math>12 + 8 = 20</math> <math>8 + 12 = 20</math></p>	<p>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</p>
		<p>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p> <p><math>16 - 4 = 12</math> so <math>12 + 4 = 16</math></p>	
<p><u>KEY VOCABULARY</u> Add, more, make, sum, total, double, altogether, one more, two more, ten more, how many to make...?, how many more is...than...? difference.</p>	<p><u>KEY VOCABULARY</u> +, add, more, plus, make, sum, total, altogether, =, equals, score, double, near double, one more, two more... ten more... how many more to make...? how many more is... than...? how much more is...? number bonds, put together distance between, difference between</p>	<p><u>KEY VOCABULARY</u> +, add, addition, more, plus, Make, sum and difference, total, Altogether, inverse, Score, Double, near double, One more, two more..... ten more..... one hundred more, How many more to make? How many more is ... than ... ? How much more is .....? =, equals, sign, is the same as</p>	<p><u>KEY VOCABULARY</u> +, add, addition, more, plus, Make, sum, total, Altogether, increase, score, Double, near double, One more, two more..... ten more..... one hundred more, How many more to make? How many more is ... than ... ? How much more is .....? Three-digit number and ones, tens, hundreds</p>

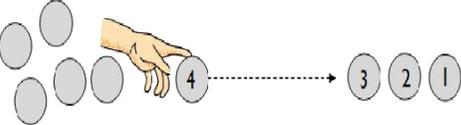
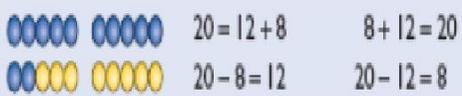


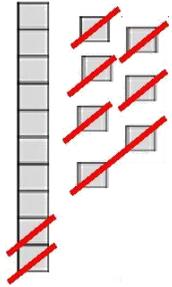
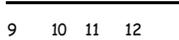
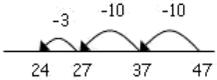
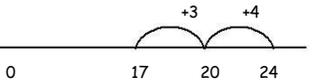
## Addition

Year 4	Year 5	Year 6
<p>Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p> $\begin{array}{r} 2492 \\ + 1321 \\ \hline 3813 \\ 1 \end{array}$	<p>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p> $\begin{array}{r} 35267 \\ + 35168 \\ \hline 70435 \\ 1 \quad 1 \quad 1 \end{array}$ $\begin{array}{r} 194.82 \\ + 116.01 \\ \hline 310.83 \\ 1 \quad 1 \end{array}$ $\begin{array}{r} 514.829 \\ + 136.091 \\ \hline 650.920 \\ 1 \quad 1 \quad 1 \end{array}$	<p>Perform mental calculations, including with mixed operations and large numbers</p>
<p>Estimate and use inverse operations to check answers to a calculation</p>	<p>Add and subtract numbers mentally with increasingly large numbers</p> <p>e.g. <math>12462 - 2300 = 10162</math></p>	<p>Use their knowledge of the order of operations to carry out calculations involving the four operations</p>
<p>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p> <p>When using decimals</p> $\begin{array}{r} 2.71 \\ 42.42 \\ \hline 45.13 \\ 1 \end{array}$	<p>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</p>	<p>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p> $\begin{array}{r} 3453.56 \\ 2451.45 \\ + 3252.17 \\ \hline 9157.18 \end{array}$
	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Solve problems involving addition, subtraction, multiplication and division</p>

		Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
<u>KEY VOCABULARY</u> Add, addition, more, plus, increase, Sum, total, altogether, Score Double, near double, tenths, How many more to make?, inverse, columnar addition, Equals, sign, is the same as	<u>KEY VOCABULARY</u> Add, addition, more, plus, increase, Sum, total, altogether, Score Double, near double, How many more to make?, Equals, sign, is the same as, Tens boundary, hundreds boundary, Units boundary, tenths boundary, hundredths, thousandths, Inverse, Columnar addition	<u>KEY VOCABULARY</u> Add, addition, more, plus, increase, Sum, total, altogether, Score, Double, near double, How many more to make?

## Subtraction

Foundation stage	Yr 1	Yr 2	Yr 3
<p>Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.</p>  <p>Five fat sausages frying in a pan ...</p> <p>Ten green bottles hanging on the wall ...</p>   <p>3 teddies take away 2 teddies leaves 1 teddy.</p>	<p>read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>represent and use number bonds and related subtraction facts within 20</p> <p>e.g. <math>9 + 7 = 16</math>; <math>16 - 7 = 9</math>; <math>7 = 16 - 9</math></p>  <p><math>6 + ? = 10</math>      <math>? + 6 = 10</math>  <math>10 - 6 = ?</math>      <math>10 - 4 = 6</math></p>  <p><math>20 = 12 + 8</math>      <math>8 + 12 = 20</math>  <math>20 - 8 = 12</math>      <math>20 - 12 = 8</math></p>	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> <li>using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>applying their increasing knowledge of mental and written methods</li> </ul> <p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p>	<p>add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> <li>a three-digit number and ones</li> <li>a three-digit number and tens</li> <li>a three-digit number &amp; hundreds</li> </ul> <p>add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p> <p><u>Expanded method of decomposition</u></p> $\begin{array}{r} 289 = 200 + 80 + 9 \\ -157 \quad -100 + 50 + 7 \\ \hline 100 + 30 + 2 = 132 \end{array}$ <p>Beginning to exchange</p> $\begin{array}{r} 200 \quad 110 \\ 300 + 20 + 14 \\ 324 = \quad -200 + 30 + 7 \\ -237 \quad 000 + 80 + 7 = 87 \end{array}$ <p><u>Columnar subtraction (as per NC Appendix)</u></p> <p>932 - 457 becomes</p> $\begin{array}{r} 8 \quad 12 \quad 1 \\ 9 \quad 3 \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 4 \quad 7 \quad 5 \end{array}$ <p>Answer: 475</p>

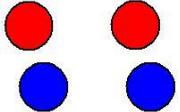
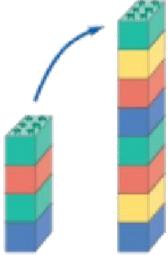
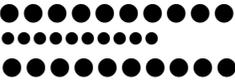
	<p>add and subtract one-digit and two-digit numbers to 20, including zero</p> <p>Bead strings or bead bars can be used to illustrate subtraction including bridging through ten by counting back 3 then counting back 2.</p> <p><math>13 - 5 = 8</math></p>  <p><math>17 - 9 = 8</math></p>  <p>Practically using Base 10 equipment</p> <p>Children then begin to use numbered lines to support their own calculations - using a numbered line to count back in ones.</p> <p><math>12 - 3 = 9</math></p> 	<p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> <li>• a two-digit number and ones</li> <li>• a two-digit number and tens</li> <li>• two two-digit numbers</li> <li>• adding three one-digit numbers</li> </ul> <p><math>47 - 23 = 24</math></p>  <p><u>Counting on</u></p> <p><math>24 - 17 = 7</math></p> 	<p>estimate the answer to a calculation and use inverse operations to check answers</p>
	<p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as</p> <p><math>7 = \square - 9</math></p>	<p>show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p>	<p>solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</p>
		<p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p>	
<p><u>KEY VOCABULARY</u> Forwards, backwards, take away, less, amount, how many left?</p>	<p><u>KEY VOCABULARY</u> -, subtract, take (away), minus, leave, how many are left? how many have gone? one less, two less, ten less... how many fewer is... than...? how much less is...? difference between, half, halve equals sign (=), take away, distance between, difference between, less than.</p>	<p><u>KEY VOCABULARY</u> -, subtract, subtraction, take (away), minus, Leave, inverse how many are left / left over? One less, two less..... ten less..... One hundred less How many fewer is .... Than .....? How much less is .....? Difference between, Half, halve =, equals, sign, is the same as, Tens boundary</p>	<p><u>KEY VOCABULARY</u> -, subtract, subtraction, take (away), minus, Leave, how many are left / left over? One less, two less..... ten less..... One hundred less How many fewer is .... Than .....? How much less is .....? Difference between, Half, halve =, equals, sign, is the same as, Tens boundary,</p>

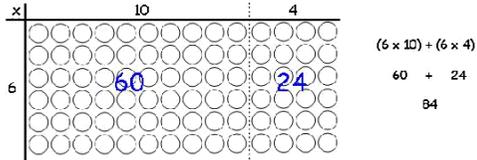
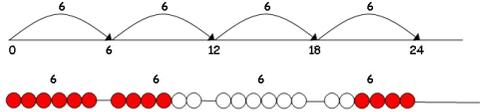


## Subtraction

Yr 4	Yr 5	Yr 6
<p>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p> <p>2314 – 1425 =</p> $\begin{array}{r} \overset{1}{2} \overset{12}{3} \overset{10}{1} \overset{1}{4} \\ - \underset{8}{1} \underset{8}{4} \underset{8}{25} \\ \hline \end{array}$	<p>add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p> <p>231.44 – 161.25 =</p> $\begin{array}{r} \overset{1}{2} \overset{13}{1} \overset{3}{4} \overset{1}{4} \\ - \underset{8}{1} \underset{8}{6} \underset{8}{1} \underset{8}{25} \\ \hline \end{array}$ <p>70.19</p>	<p>perform mental calculations, including with mixed operations and large numbers</p>
<p>estimate and use inverse operations to check answers to a calculation</p>	<p>add and subtract numbers mentally with increasingly large numbers</p>	<p>use their knowledge of the order of operations to carry out calculations involving the four operations</p>
<p>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p>	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p>
	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>solve problems involving addition, subtraction, multiplication and division</p>
		<p>use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</p>
<p><b><u>KEY VOCABULARY</u></b>            subtract, subtraction, take (away), minus, decrease, leave, how many are left/left over?, Difference between, Half, halve, How many more / fewer is..... than.....? How much more / less is.....? Equals, sign, is the same as            Tens boundary, hundreds boundary, Inverse, Columnar subtraction</p>	<p><b><u>KEY VOCABULARY</u></b>            Subtract, subtraction, take (away), minus, decrease            Leave, how many are left / left over? Difference between, Half, halve, How many more / fewer is..... than.....? How much more / less is.....? , tens boundary, hundreds boundary, units boundary, tenths boundary, inverse, equals, sign, is the same as</p>	<p><b><u>KEY VOCABULARY</u></b>            Subtract, subtraction, take (away), minus, decrease, Leave, how many are left / left over? Difference between, Half, halve, How many more / fewer is..... than.....? How much more / less is.....? Equals, sign, is the same as, Tens boundary, hundreds boundary            Units boundary, tenths boundary, Inverse, Columnar subtraction</p>

# Multiplication

Foundation stage	Yr 1	Yr 2	Yr 3
<p>They solve problems, including doubling, halving and sharing.</p>  <p>Two and two more = four. Double 2 is 4 2 add the same again makes 4</p>  <p>double 4 is 8</p>	<p>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.</p> <p><math>5 \times 3 = 5 + 5 + 5</math></p>  <p>There are 3 sweets in one bag. How many sweets are there in 5 bags?</p>  <p><u>Arrays</u></p> <p>0 0 0 0 0 0 0 0 0 0 <math>5 \times 3 = 15</math> 0 0 0 0 0</p> <p><math>3 \times 5 = 15</math></p>  <p><math>2 \times 3 = 6</math></p>	<p>recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p>	<p>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.</p>
		<p>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</p> <p>What number do we need?</p> <p><math>30 = \square \times 10</math></p>  <p><math>3 \times \square = 15</math></p>	<p>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><u>Partitioning</u></p> <p><math>14 \times 6 = (10 \times 6) + (4 \times 6)</math>  <math>= 60 + 24</math>  <math>= 84</math></p>

			 <p>Leading to the Grid Method</p> <p><b>TU x U</b> (Short multiplication - multiplication by a single digit) 23 x 8</p> <table border="1" data-bbox="1711 424 1879 488"> <tr> <td>X</td> <td>10</td> <td>4</td> </tr> <tr> <td>6</td> <td>60</td> <td>24</td> </tr> </table> <p>60 + 24 = 84</p>	X	10	4	6	60	24
X	10	4							
6	60	24							
		<p>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p> <p>•••• 4 x 2 = 8 ••••</p> <p>2 x 4 = 8</p> <p>•• •• 2 x 4 = 8 ••</p> <p>4 x 2 = 8</p> <p>4 x 5 = 20    20 ÷ 5 = 4 5 x 4 = 20    20 ÷ 4 = 5</p>	<p>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.</p>						
		<p>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts</p> 							
<p><b>KEY VOCABULARY</b> Double, doubling, Lots of</p>	<p><b>KEY VOCABULARY</b> count in 2, 5, 10, array, =, equals, sign, is the same as, grouping, doubling</p>	<p><b>KEY VOCABULARY</b> Lots of, groups of, Multiplication / division facts X, times, multiply, multiplied by, Multiple of</p>	<p><b>KEY VOCABULARY</b> Lots of, groups of, X, times, multiply, multiplication, multiplied by, Multiple of, product</p>						

Once, Twice, three times ..... ten times .....  
Times as (big, long, wide..... and so on), Repeated  
addition, Array, Row, column, Double

Once, Twice, three times ..... ten times .....  
Times as (big, long, wide..... and so on)  
Repeated addition, Array, Row, column, Double

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## Multiplication

Yr 4	Yr 5	Yr 6
<p>recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math></p>	<p>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</p>	<p>multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> $124 \times 126 =$ <pre> 124 X 126 ----- 12400  2480    744 ----- 15624   1 </pre>
<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>know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</p>	<p>perform mental calculations, including with mixed operations and large numbers</p>
<p>recognise and use factor pairs and commutativity in mental calculations</p>	<p>establish whether a number up to 100 is prime and recall prime numbers up to 19.</p>	<p>identify common factors, common multiples and prime numbers</p>
<p>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p> <p><math>346 \times 9 =</math></p> <p><math>2700 + 360 + 54 = 3114</math></p>	<p>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.</p> <p><b>Short multiplication</b></p>	<p>use their knowledge of the order of operations to carry out calculations involving the four operations</p>

$$\begin{array}{r} \times \quad \quad \quad 6 \\ 1 \ 6 \ 4 \ 4 \ 6 \\ \hline 4 \ 2 \end{array}$$

Answer: 16 446

**Short multiplication**

24 × 6 becomes

$$\begin{array}{r} 2 \ 4 \\ \times \quad 6 \\ \hline 1 \ 4 \ 4 \\ 2 \end{array}$$

Answer: 144

342 × 7 becomes

$$\begin{array}{r} 3 \ 4 \ 2 \\ \times \quad \quad 7 \\ \hline 2 \ 3 \ 9 \ 4 \\ 2 \ 1 \end{array}$$

Answer: 2394

**Long multiplication**

24 × 16 becomes

$$\begin{array}{r} 2 \\ 2 \ 4 \\ \times 1 \ 6 \\ \hline 2 \ 4 \ 0 \\ 1 \ 4 \ 4 \\ \hline 3 \ 8 \ 4 \end{array}$$

Answer: 384

124 × 26 becomes

$$\begin{array}{r} 1 \ 2 \\ 1 \ 2 \ 4 \\ \times \quad 2 \ 6 \\ \hline 2 \ 4 \ 8 \ 0 \\ 7 \ 4 \ 4 \\ \hline 3 \ 2 \ 2 \ 4 \\ 1 \ 1 \end{array}$$

Answer: 3224

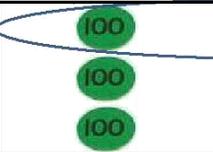
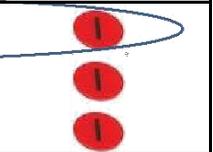
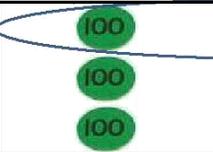
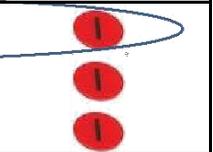
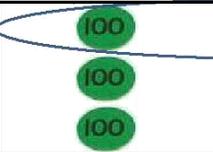
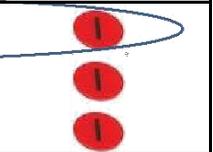
<p>solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p> <p>Distributive law  <math>39 \times 7 = 30 \times 7 + 9 \times 7</math></p> <p>Associative law  <math>(2 \times 3) \times 4 = 2 \times (3 \times 4)</math></p>	<p>multiply and divide numbers mentally drawing upon known facts</p>	<p>solve problems involving addition, subtraction, multiplication and division</p>
	<p>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p>	<p>use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</p>
	<p>recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</p>	
	<p>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</p>	
	<p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p>	
	<p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</p>	
<p><u>KEY VOCABULARY</u>  Lots of, groups of, Times, multiply, multiplication, multiplied by  Multiple of, product, Once, Twice, three times ..... ten times .....  Times as (big, long, wide..... and so on), Repeated addition, Array  Row, column, inverse</p>	<p><u>KEY VOCABULARY</u>  Lots of, groups of, Times, multiply, multiplication, multiplied by  Multiple of, product, Once, Twice, three times ..... ten times .....  Times as (big, long, wide..... and so on) Repeated addition, Array  Row, column, Double, Inverse</p>	<p><u>KEY VOCABULARY</u>  Lots of, groups of, Times, multiply, multiplication, multiplied by  Multiple of, product, Once, Twice, three times ..... ten times .....  Times as (big, long, wide..... and so on) Repeated addition, Array,  row, column, Double</p>

# Division

Foundation stage	Yr 1	Yr 2	Yr 3				
<p>They solve problems, including doubling, halving and sharing.</p> <p>Half of 6 is 3  <math>\frac{1}{2}</math> of 6 = 3</p>	<p>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.</p> <p><u>Arrays</u>     <math>12 \div 3 = 4</math>   <math>12 \div 4 = 3</math></p> <p>Cutting cakes, pizza in half, sharing related to fractions            Finding half of a group of objects</p>	<p>recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p> <p>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</p> <p>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p> <p>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p> <p><u>Repeated subtraction using a number line</u>  <math>+6 \quad +6 \quad +6 \quad +6 \quad +6</math>              Remainders <math>17 \div 5 = 3r2</math></p> <p><u>Using symbols to stand for unknown numbers to complete equations using inverse operations</u>  <math>26 \div 2 = \square</math>      <math>24 \div \triangle = 12</math>      <math>\square \div 10 = 8</math></p>	<p>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.</p> <p>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>Use Very Important Box (VIB), think box,  <math>105 \div 7 = 15</math></p> <table style="width: 100%; text-align: center;"> <tr> <td><math>10 \times 7</math></td> <td><math>5 \times 7</math></td> </tr> <tr> <td>0</td> <td>70      105</td> </tr> </table> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> <p><u>VIB</u>  <math>20 \times 7 = 140</math>  <math>10 \times 7 = 70</math>  <math>5 \times 7 = 35</math>  <math>2 \times 7 = 14</math>  <math>1 \times 7 = 7</math></p> </div> <p>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.</p>	$10 \times 7$	$5 \times 7$	0	70      105
$10 \times 7$	$5 \times 7$						
0	70      105						
<p><u>KEY VOCABULARY</u>            Half, halve, halving, sharing</p>	<p><u>KEY VOCABULARY</u>            =, equals, sign, is the same as, grouping, sharing, fraction</p>	<p><u>KEY VOCABULARY</u>            Halve, Share, share equally, One each, two each...            Group in pairs, threes ..... Tens, Equal groups of,  <math>\div</math>, divide, divided by, divided into, Left, left over</p>	<p><u>KEY VOCABULARY</u>            Halve, Share, share equally, One each, two each, three each ... Group in pairs, threes .... Tens            Equal groups of, inverse, Long/short</p>				

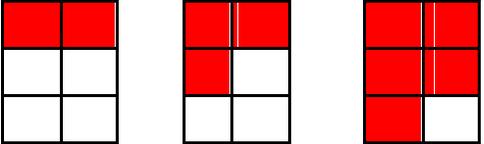
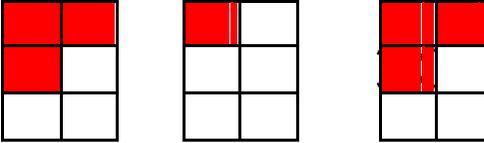
| multiplication, Prime

# Division

Yr 4	Yr 5	Yr 6						
<p>recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math></p>	<p>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</p>	<p>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</p> <p><b>Long division</b></p> <p><math>432 \div 15</math> becomes</p> $\begin{array}{r} 28 \text{ r}12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$ <p>Answer: 28 remainder 12</p> <p><math>432 \div 15</math> becomes</p> $\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array} \quad \begin{array}{l} 15 \times 20 \\ 15 \times 8 \end{array}$ <p><math>\frac{12}{15} = \frac{4}{5}</math></p> <p>Answer: <math>28 \frac{4}{5}</math></p> <p><math>432 \div 15</math> becomes</p> $\begin{array}{r} 28 \cdot 8 \\ 15 \overline{) 4320} \\ \underline{300} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$ <p>Answer: 28.8</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><b>Short division</b></p> <p><math>98 \div 7</math> becomes</p> $\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{70} \\ 28 \\ \underline{28} \\ 0 \end{array}$ <p>Answer: 14</p> <p><math>432 \div 5</math> becomes</p> $\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \underline{400} \\ 32 \\ \underline{30} \\ 2 \end{array}$ <p>Answer: 86 remainder 2</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><b>VIB</b></p> <p><math>9 \times 7 = 63</math>  <math>8 \times 7 = 56</math>  <math>7 \times 7 = 49</math>  <math>6 \times 7 = 42</math>  <math>5 \times 7 = 35</math>  <math>4 \times 7 = 28</math>  <math>3 \times 7 = 21</math>  <math>2 \times 7 = 14</math>  <math>1 \times 7 = 7</math></p> </div>	<p>know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</p>							
<p>Place value counters help reinforce the concept of division</p> <p><math>363 \div 3 = 121</math></p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>H</th> <th>T</th> <th>U</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	H	T	U				<p>establish whether a number up to 100 is prime and recall prime numbers up to 19.</p>	<p>divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context</p>
H	T	U						
								
<p>multiply and divide numbers mentally drawing upon known facts</p> $\begin{array}{r} 121 \\ 3 \overline{) 363} \\ \underline{300} \\ 63 \\ \underline{63} \\ 0 \end{array}$		<p>perform mental calculations, including with mixed operations and large numbers</p>						

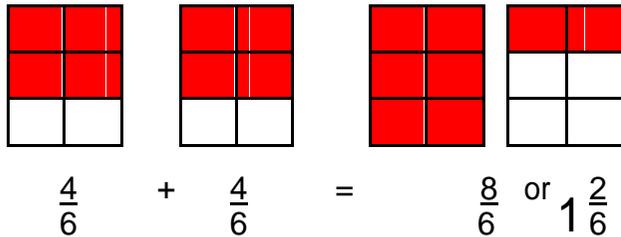
<p>recognise and use factor pairs and commutativity in mental calculations</p>	<p>Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context.</p> <p>1253 ÷ 9 becomes</p> $\begin{array}{r} 139 \text{ r}2 \\ 9 \overline{) 1253} \\ \underline{38} \phantom{0} \\ 38 \phantom{0} \\ \underline{38} \phantom{0} \\ 0 \phantom{0} \end{array}$ <p>Answer: 139 r2 or <math>139 \frac{2}{9}</math></p>	<p>identify common factors, common multiples and prime numbers</p>
	<p>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p>	<p>use their knowledge of the order of operations to carry out calculations involving the four operations</p>
	<p>recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</p>	<p>solve problems involving addition, subtraction, multiplication and division</p>
	<p>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</p>	<p>use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</p>
	<p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p>	
	<p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</p>	
<p><u>KEY VOCABULARY</u> Double, halve, Share, share equally, One each, two each, three each ..... Group in pairs, threes ..... Tens, Equal groups of, Divide, division, divided by, divided into, Remainder, Factor, quotient, divisible by, Inverse, Integer scaling problems.</p>	<p><u>KEY VOCABULARY</u> halve, Share, share equally, One each, two each, three each ..... Group in pairs, threes ..... Tens, Equal groups of, Divide, division, divided by, divided into, Remainder, Factor, quotient, divisible by, Inverse, Prime number, prime factor, composite (non-prime) Square (²), cubed (³)</p>	<p><u>KEY VOCABULARY</u> halve, Share, share equally, One each, two each, three each ..... Group in pairs, threes ..... Tens, Equal groups of, Divide, division, divided by, divided into, Remainder, Factor, quotient, divisible by, Inverse, Long/short division, Prime</p>

## Calculating with fractions

Foundation Stage	Yr 1	Yr 2	Yr 3
			<p data-bbox="1464 220 2114 274">Add and subtract fractions with the same denominator within one whole (e.g. <math>\frac{1}{4} + \frac{3}{4} = \frac{4}{4}</math>)</p> <div data-bbox="1487 325 1971 564"><math display="block">\frac{2}{6} + \frac{3}{6} = \frac{5}{6}</math></div> <div data-bbox="1487 587 1971 820"><math display="block">\frac{3}{6} - \frac{1}{6} = \frac{2}{6}</math></div>

Yr 4

Add and subtract fractions with the same denominator.



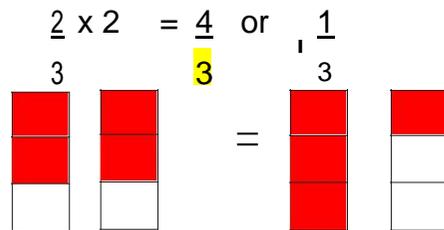
Yr 5

Add and subtract fractions with the same denominator and denominators that are multiples of the same number

Write mathematical statements >1 as a mixed number

For example  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$

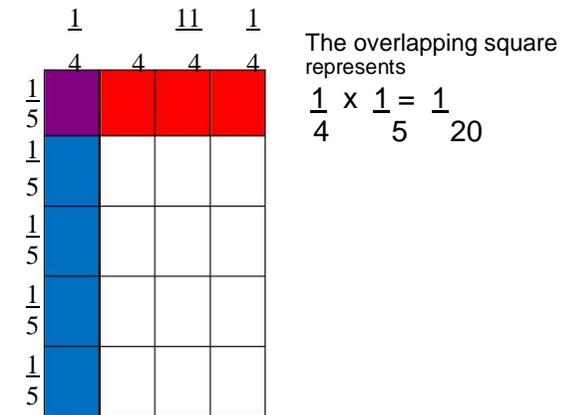
Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.



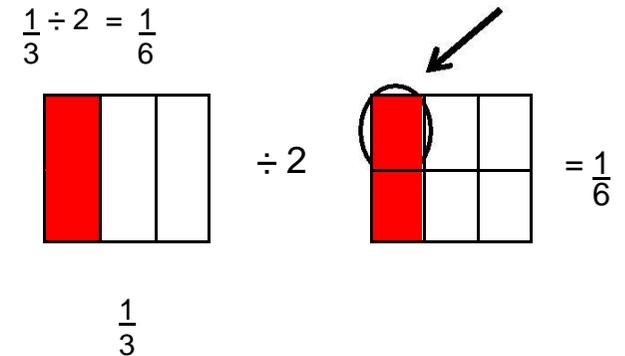
Yr 6

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.

Multiply simple pairs of proper fractions, writing the answer in its simplest form.



Divide proper fractions by whole numbers.



**\*\*Teachers note\*\***

Teach ÷ by whole numbers before X by fractions to support the children's conceptual understanding, e.g. that ÷ 2 is the same as X 1/2