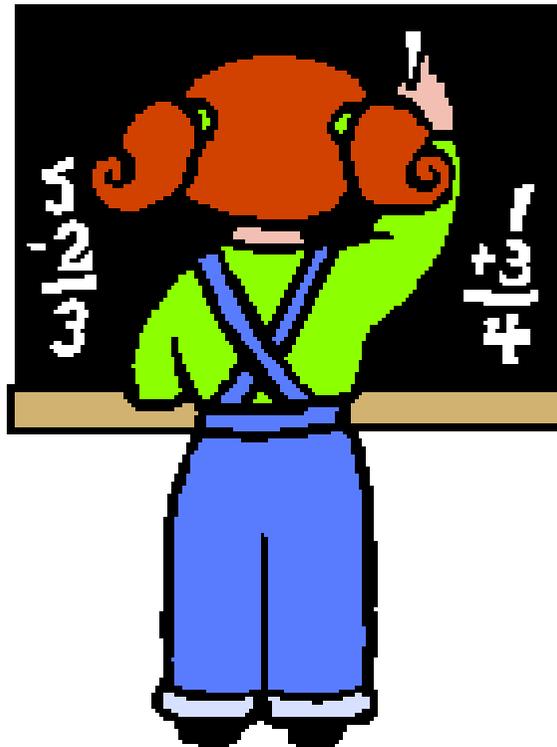


Tyneview Primary School  
Parent Calculation Policy  
(Updated to support new curriculum)



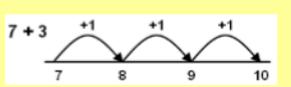
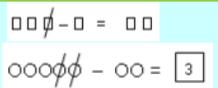
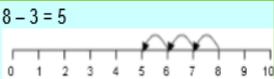
### Parent Calculation policy

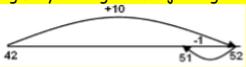
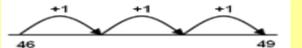
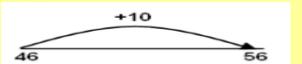
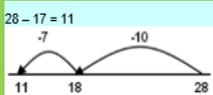
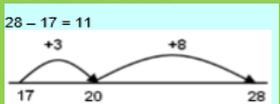
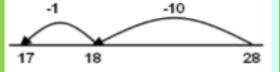
Please use this information to support your child at home. The policy is arranged in Year groups however since it is related to the new curriculum with a higher expectation, most children will be working at a standard below their current year group.

if you are not sure where your child is currently working, please see your child's class teacher.

**NB - For reception this is a suggestion of how calculation could be taught as it depends on the range, ability and cohort.**

Reception	Addition	Subtraction	Vocabulary
<p>Numbers:</p> <ul style="list-style-type: none"> <li>Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number.</li> <li>Using quantities and objects, they add and subtract two single-digit numbers</li> <li>Count on or back to find the answer.</li> <li>They solve problems, including doubling, halving and sharing.</li> </ul>	<div data-bbox="568 352 913 683" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><u>Make 6</u></p> </div> <p>Children are encouraged to develop a mental picture of the number system in their heads to use for calculation.</p> <p>Children who are ready may record this as:</p> <p>6 = 2 + 4   6 = 3 + 3   6 = 4 + 2   6 = 0 + 6   6 = 1 + 5 6 = 5 + 1</p>	<div data-bbox="949 352 1308 683" style="border: 1px solid black; padding: 5px;"> <p>b</p> <p>with my sheep I had a sheep &amp; sheep he has 5 left he has 3 left</p> </div> <p>Children who are ready may record this as:</p> <p>8 - 5 = 3</p>	<p>add, more, and make, sum, total altogether score double one more, two more, ten more... how many more to make...? how many more is... than...? take (away), leave how many are left/left over? how many have gone? one less, two less... ten less... how many fewer is... than...? difference between is the same as</p>

Year One	Addition	Subtraction	
<ul style="list-style-type: none"> <li>read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> <li>represent and use number bonds and related subtraction facts within 20</li> <li><b>add and subtract one-digit and two-digit numbers to 20</b>, including zero</li> <li>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>.</li> </ul>	<p>Put number in head and count on.</p> <p>Add pairs with a total of 10.</p> <p>Using a completed number line or track to count on.</p> <p>Begin to partition and recombine by breaking units of 6, 7, 8, 9 into 5 and a bit e.g. work out mentally that:  <math>5+8 = 5 + (5 \text{ and } 3)</math>  <math>= 5 + 5 + 3</math>  <math>= 10 + 3</math>  <math>= 13</math></p> <p>Using empty number line to count on.</p>  <p>7 + 3</p> <p>7 8 9 10</p> <p>Arrows show jumps of +1 from 7 to 8, 8 to 9, and 9 to 10.</p> <p>Addition and subtraction facts to 10 and then 20.</p>	<p>Using a completed number line (or number track) to count back</p> <p>Symbolic representations: How many less?</p>  <p>Leading to empty box as above with numerals</p> <p>Ensure understand they put the largest number to subtract/take away.  <math>10 - 3 = \square</math> <math>10 - \square = 6</math></p>  <p><math>8 - 3 = 5</math></p> <p>Number line from 0 to 10 with arrows showing jumps of -1 from 8 to 7, 7 to 6, and 6 to 5.</p>	<p><b>Vocabulary</b></p> <p>+, add, more plus make, sum, total altogether score double, near double one more, two more... ten more how many more to make...? how many more is... than...? how much more is...? - subtract, take (away), minus leave how many are left/left over? 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, is the same as</p>

Year Two	Addition	Subtraction	
<ul style="list-style-type: none"> <li>• solve problems with addition and subtraction: 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> <li>• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</li> <li>• <b>add and subtract numbers</b> using concrete objects, pictorial representations, and mentally, including: <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> </li> <li>• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</li> <li>• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</li> </ul>	<p><b>Adding 9 by adding 10 &amp; adjusting</b></p>  <p>Solve number problems using conventional signs and symbols. Develop children's own recording in the context of practical work and explaining how problems were solved. Using a number line or number grid to count on in 1s or 10s (or in head)</p>   <p>Children should be aware that calculations can be recorded in a linear way or in columns to prepare them for future year groups.</p>	<p>Empty number box problems <math>10 - 7 = \square</math> <math>10 - \square = 3</math>. Subtract 9 by subtracting 10 and adjusting leading to subtract 19. Partition numbers into tens and units on a blank number line.</p>  <p>Use an empty number line to count on/back to find the difference.</p>   <p>Children should be aware that calculations can be recorded in a linear way or in columns to prepare them for future year groups.</p>	<p style="text-align: center;"><b>Vocabulary</b></p> <p>+, add, addition, more, plus make, sum, total altogether 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...? - 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>

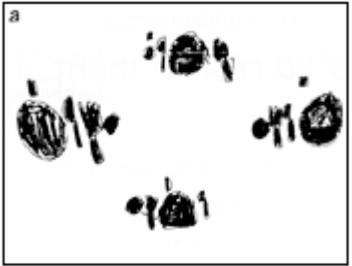
Year Three	Addition	Subtraction	
<ul style="list-style-type: none"> <li>▪ add and subtract numbers mentally, including:               <ul style="list-style-type: none"> <li>▪ a three-digit number and ones</li> <li>▪ a three-digit number and tens</li> <li>▪ a three-digit number and hundreds</li> </ul> </li> <li>▪ add and subtract numbers <b>with up to three digits</b>, using formal written methods of columnar addition and subtraction</li> <li>▪ estimate the answer to a calculation and use inverse operations to check answers</li> <li>▪ solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</li> </ul>	<p>64 + 23 becomes:  <math>60 + 4</math>  <math>\begin{array}{r} 20 + 3 \\ \hline 80 + 7 = 87 \end{array}</math></p> <p>736 + 242 becomes:  <math>700 + 30 + 6</math>  <math>\begin{array}{r} 200 + 40 + 2 \\ \hline 900 + 70 + 8 = 978 \end{array}</math></p> <p>When children are confident with above:</p> <p>764 + 527 becomes:  <math>700 + 60 + 4</math>  <math>\begin{array}{r} 500 + 20 + 7 \\ \hline 1200 + 80 + 11 = 1291 \end{array}</math></p>	<p>64 - 23 becomes:  <math>60 + 4</math>  <math>\begin{array}{r} 20 + 3 \\ \hline 40 + 7 = 47 \end{array}</math></p> <p>756 - 242 becomes:  <math>700 + 50 + 6</math>  <math>\begin{array}{r} 200 + 40 + 2 \\ \hline 500 + 10 + 4 = 514 \end{array}</math></p> <p>When children are confident with above:</p> <p>764 - 572 becomes:  <math>600</math>  <math>\begin{array}{r} 700 + 60 + 4 \\ \hline 500 + 70 + 2 \\ \hline 100 + 00 + 2 \end{array}</math></p>	<p style="text-align: center;"><b>Vocabulary</b></p> <p>+, add, addition, more, plus make, sum, total altogether 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...? - 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</p>

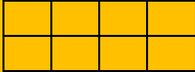
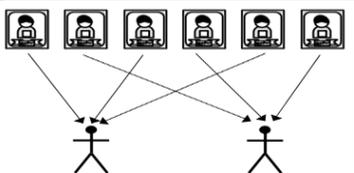
Year Four	Addition	Subtraction	
<ul style="list-style-type: none"> <li>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</li> <li>estimate and use inverse operations to check answers to a calculation</li> <li>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>	<p>4532 + 2146 becomes:</p> $\begin{array}{r} 4532 \\ + 2146 \\ \hline 6678 \end{array}$ <p>When children are confident move onto:</p> <p>6754 + 3528 becomes:</p> $\begin{array}{r} 6754 \\ + 3528 \\ \hline 10282 \end{array}$	<p>8745 - 5232 becomes:</p> $\begin{array}{r} 8745 \\ - 5232 \\ \hline 3513 \end{array}$ <p>When children are confident move onto:</p> <p>8745 - 6932 becomes:</p> $\begin{array}{r} 8745 \\ - 6932 \\ \hline 1813 \end{array}$	<p style="text-align: center;"><b>Vocabulary</b></p> <p>add, addition, more, plus, increase sum, total, altogether score double, near double how many more to make...? 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</p>

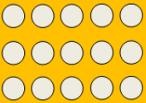
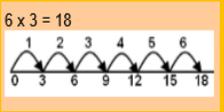
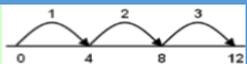
Year Five	Addition	Subtraction	
<ul style="list-style-type: none"> <li>add and subtract <b>whole numbers with more than 4 digits</b>, including using formal written methods (columnar addition and subtraction)</li> <li>add and subtract numbers mentally with increasingly large numbers</li> <li>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</li> <li>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>	<p>54532 + 42146 becomes:</p> $\begin{array}{r} 54532 \\ +42145 \\ \hline 96677 \end{array}$ <p>When children are confident move onto:</p> <p>36754 + 13528 becomes:</p> $\begin{array}{r} 36754 \\ +13528 \\ \hline 50282 \end{array}$ <p>When children are confident with place value they can move on to decimal numbers with the same amount of decimal places.</p>	<p>87453 - 52322 becomes:</p> $\begin{array}{r} 87453 \\ -52322 \\ \hline 35131 \end{array}$ <p>When children are confident move onto:</p> <p>87454 - 69323 becomes:</p> $\begin{array}{r} 87454 \\ -69323 \\ \hline 18131 \end{array}$ <p>When children are confident with place value they can move on to decimal numbers with the same amount of decimal places.</p>	<p style="text-align: center;"><b>Vocabulary</b></p> <p>add, addition, more, plus, increase sum, total, altogether score double, near double how many more to make...? 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</p>

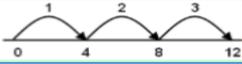
Year Six	Addition	Subtraction	
<ul style="list-style-type: none"> <li>▪ perform mental calculations, including with mixed operations and large numbers</li> <li>▪ use their knowledge of the order of operations to carry out calculations involving the four operations</li> <li>▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>▪ solve problems involving addition, subtraction, multiplication and division</li> <li>▪ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> </ul>	<p>545.32 + 421.45 becomes:</p> $\begin{array}{r} 545.32 \\ + 421.45 \\ \hline 966.77 \end{array}$ <p>When children are confident move onto numbers with different numbers of decimal places:</p> <p>367.54 + 135.2 becomes:</p> $\begin{array}{r} 367.54 \\ + 135.2 \\ \hline 502.74 \end{array}$	<p>525.45 - 441.32 becomes:</p> $\begin{array}{r} 525.45 \\ - 441.32 \\ \hline 84.13 \end{array}$ <p>When children are confident move onto numbers with different numbers of decimal places:</p> <p>367.54 + 135.2 becomes:</p> $\begin{array}{r} 367.54 \\ - 135.2 \\ \hline 232.34 \end{array}$	<p style="text-align: center;"><b>Vocabulary</b></p> <p>add, addition, more, plus, increase sum, total, altogether score double, near double how many more to make...? 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</p>

NB - For reception this is a suggestion of how calculation could be taught as it depends on the range, ability and cohort.

Reception	Multiplication	Division	
<ul style="list-style-type: none"><li>Explores &amp; solves practical problems such as doubling, halving, grouping &amp; sharing, using own methods</li></ul>	<p>Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They should experience practical calculation opportunities involving equal sets or groups using a wide variety of equipment, e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc.</p> 	<p>Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They should experience practical calculation opportunities involving equal groups and sharing items using a wide variety of equipment, e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc.</p> 	<p><b>Vocabulary</b> Groups, share, equally, total, each, how many, lots of.</p>

Year One	Multiplication	Division	
<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>They make connections between arrays, number patterns, and counting in twos, fives and tens.</li> </ul>	<p>Recording should begin pictorially and multiplication sentences should be written alongside repeated addition:</p> <p><math>2 + 2 + 2 + 2 = 8</math>  <math>2 \times 4 = 8</math></p> <p>Multiplication can be arranged in arrays in different ways. <math>4 \times 2</math> and <math>2 \times 4</math></p>  	<p>In problem solving contexts, children will use practical equipment to share out objects equally and to group objects to represent division and record these as simple division number sentences: 6 football stickers are shared between 2 people, how many do they each get? Children may solve this by using a 'one for you, one for me' strategy until all of the cards have been given out.</p>  <p>Children should find the answer by counting how many cards <b>1 person</b> has got. So <math>6 \div 2 = 3</math></p> <p>There are 6 football stickers, how many people can have 2 stickers each?</p>  <p>Children should find the answer by counting how many <b>groups of 2</b> there are. So <math>6 \div 2 = 3</math></p>	<p style="text-align: center;"><b>Vocabulary</b></p> <p>lots of, groups of <math>\times</math>, times, multiply, multiplied by multiple of once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition, double, halve share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of <math>\div</math>, divide, divided by, left</p>

Year Two	Multiplication	Division	
<ul style="list-style-type: none"> <li>recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</li> <li>calculate mathematical statements for multiplication and division within the <b>multiplication tables</b> and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (<math>=</math>) signs</li> <li>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</li> <li>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</li> </ul>	<p>Continue to use arrays as a form of recording and to support understanding of commutative law.</p> <p><math>3 \times 5</math> can be :</p>   <p>Multiplication as repeated addition using an empty number line.</p> 	<p>Children will utilise practical equipment to represent division calculations as grouping (repeated subtraction) and use jottings to support their calculation, e.g. <math>12 \div 3 =</math></p>  <p>Children should then move onto using an empty number line to divide by initially by 2, 5 and 10.</p> <p><math>12 \div 4 = 3</math> becomes:</p> 	<p style="text-align: center;"><b>Vocabulary</b></p> <p>lots of, groups of <math>\times</math>, times, multiply, multiplied by multiple of once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array row, column double, halve share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of <math>\div</math>, divide, divided by, divided into left, left over, commutative, odd, even</p>

Year Three	Multiplication	Division	
<ul style="list-style-type: none"> <li>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</li> <li>write and calculate mathematical statements for <b>multiplication and division using the multiplication tables that they know</b>, including for <b>two-digit numbers times one-digit numbers</b>, using mental and progressing to formal written methods</li> <li>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.</li> </ul>	<p>Multiplication as repeated addition using an empty number line.</p> <p><math>6 \times 3 = 18</math></p>  <p>Introduce partitioning for TU x U</p> <p><math>24 \times 6</math> becomes:</p> $\begin{array}{r} 24 \\ \times 6 \\ \hline 24 \quad (6 \times 4) \\ 120 \quad (6 \times 20) \\ \hline 144 \end{array}$	<p>Continue to use empty number lines using known times tables</p> <p><math>12 \div 4 = 3</math> becomes:</p>  <p>Moving on to more formal methods using repeated subtraction:</p> $\begin{array}{r} 3 \\ 4 \overline{) 12} \\ \underline{4} \quad (1 \times 4) \\ 8 \\ \underline{4} \quad (1 \times 4) \\ 0 \end{array}$ <p>Moving onto taking away larger groups of the divisor:</p> $\begin{array}{r} 3 \\ 4 \overline{) 12} \\ \underline{12} \quad (4 \times 3) \\ 0 \end{array}$	<p style="text-align: center;"><b>Vocabulary</b></p> <p>lots of, groups of <math>\times</math>, 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, halve share, share equally one each, two each, three each...group in pairs, threes... tens equal groups of <math>\div</math>, divide, division, divided by, divided into left, left over, remainder</p>

Year Four	Multiplication	Division	
<ul style="list-style-type: none"> <li>recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math></li> <li>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</li> <li>recognise and use factor pairs and commutativity in mental calculations</li> <li>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</li> <li>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.</li> <li>Divide two and three digit numbers using short division with no remainders. (not in curriculum)</li> </ul>	<p>Expanded short multiplication:</p> <p><math>741 \times 6</math> becomes:</p> $\begin{array}{r} 741 \\ \times 6 \\ \hline 4200 \text{ (} 6 \times 700 \text{)} \\ 240 \text{ (} 6 \times 40 \text{)} \\ \hline 6446 \end{array}$ <p>Moving on, when children have a secure understanding, to short multiplication:</p> $\begin{array}{r} 741 \\ \times 6 \\ \hline 6446 \\ 2 \end{array}$ <p>=====</p> <p>=====</p>	<p>Short division:</p> <p><math>98 \div 7</math> becomes:</p> $\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \phantom{8} \\ 20 \\ \underline{14} \\ 68 \\ \underline{63} \\ 58 \\ \underline{56} \\ 28 \\ \underline{28} \\ 0 \end{array}$ <p><math>90 \div 7 = 10</math>  <math>20</math> left over  <math>28 \div 7 = 4</math></p> <p><math>98 \div 7</math> becomes</p> $\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \phantom{8} \\ 28 \\ \underline{28} \\ 0 \end{array}$ <p>Answer: 14</p>	<p style="text-align: center;"><b>Vocabulary</b></p> <p>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, 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</p>

Year Five	Multiplication	Division	
<ul style="list-style-type: none"> <li>▪ 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</li> <li>▪ multiply and divide numbers mentally drawing upon known facts</li> <li>▪ 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</li> <li>▪ multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</li> <li>▪ solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</li> <li>▪ solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</li> </ul>	<p>Short multiplication - when multiplying by a one digit number:</p> $\begin{array}{r} 2741 \\ \times 6 \\ \hline 16446 \end{array}$ <p>Answer: 16 446</p> <p>Long multiplication - when multiplying by a 2 digit number:</p> $\begin{array}{r} 24 \\ \times 16 \\ \hline 144 \\ 240 \\ \hline 384 \end{array}$	<p>Short division- dividing by a 1 digit number with remainders:</p> <p>Children again must be able to explain the steps of the calculation verbally.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \\ \underline{40} \phantom{0} \\ 32 \\ \underline{30} \\ 2 \end{array}$ <p>Answer: 86 remainder 2</p>	<p style="text-align: center;"><b>Vocabulary</b></p> <p>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, 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, short multiplication, long multiplication, short division</p>

