

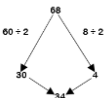
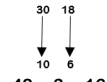
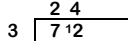

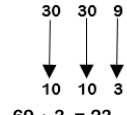
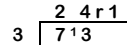
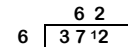




## Division KS2

<p><b>KS1</b></p>	<p>Noticing how counting in multiples of 2, 5 and 10 relates to the number of groups you have counted (introducing times tables) links to division.</p> <p>An understanding of the more you share between, the less each person will get (e.g. would you prefer to share these grapes between 2 people or 3 people? Why?)</p> <p>Secure understanding of grouping means you count the number of groups you have made. Whereas sharing means you count the number of objects in each group.</p>	
<p>Year</p>	<p>3</p>	<p>4</p>
<p>Layers of vocabulary</p>  <p><b>Appendix 1a</b> Beck's Tiers of Vocabulary <b>Appendix 1b:</b> Vocabulary book</p>	<p><b>Basic to subject specific (Beck's Tiers):</b> share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of ÷, divide, division, divided by, divided into left, left over, remainder, dividend, divisor</p> <p><b>Instructional vocabulary:</b> calculate, work out, solve, investigate question, answer, check</p>	<p><b>Basic to subject specific (Beck's Tiers):</b> share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of ÷, divide, division, divided by, divided into left, left over, remainder, dividend, divisor</p> <p><b>Instructional vocabulary:</b> calculate, work out, solve, investigate question, answer, check</p>
<p>NC 2014</p>	<p>Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including 2 digit numbers times 1 digit numbers progressing to formal written methods.</p>	<p>Practise to become fluent in the formal written method of short division with exact answers.</p>


# Division KS2

Developing Conceptual/ Procedural Understanding	<p><b>Links to tables</b></p>  <p>For example, use language of division linked to tables using counting stick</p> <p><b>Using known facts</b>                  If <math>3 \times 2 = 6</math>, then <math>30 \times 2 = 60</math>, <math>60 \div 3 = 20</math> and <math>30 = 60 \div 2</math>.</p> <p><a href="#">(OVERCOMING BARRIERS L2-L3 knowing and using number facts)</a></p> <p><a href="#">MULTIPLICATION AND DIVISION TRIOS SPREADSHEET</a></p> <p><b>Partitioning strategy to halve</b>                  Halve 68</p>  <p><b>Rearranging the dividend to find multiples of the divisor.</b>  <math>48 \div 3 =</math>                  'What do I know about the 3 x tables?'                  "I know <math>3 \times 10 = 30</math> and <math>3 \times 6 = 18</math>."</p>  <p><math>48 \div 3 = 16</math></p>	<p><b>Place value materials to represent calculations</b></p> <p><b>Short division</b>  <math>72 \div 3 =</math></p>  <p>'72 divided by 3. 7 tens shared equally between 3 is 2 with a remainder of 1 ten. Exchange the 1 ten for 10 units. I now have 12 units which shared equally between 3 is 4. The answer is 24.'</p> <p><b>Representing problems</b>                  Andy says 'I can use my three times table to work out <math>180 \div 3</math>'. Explain what Andy could do to work out this calculation.</p>	<p><b>Links to tables</b></p>  <p>For example, use language of division linked to tables using counting stick</p> <p><b>Using known facts</b>                  If <math>2 \times 3 = 6</math> then <math>200 \times 3 = 600</math> and <math>600 \div 3 = 200</math></p> <p><b>Rearranging the dividend to find multiples of the divisor.</b>  <math>69 \div 3 =</math>                  'What do I know about the 3 x tables?'                  "I know <math>3 \times 10 = 30</math> and <math>3 \times 3 = 9</math>."</p>  <p><math>69 \div 3 = 23</math></p> 	<p><b>Place value materials to represent calculations</b></p> <p><b>Short division</b>  <math>372 \div 6 =</math></p>  <p>'372 divided by 6. 3 hundreds cannot be shared equally between 6, so exchange the hundreds for 30 tens. I now have 37 tens which shared equally between 6 is 6 with a remainder of 1 ten. Exchange the ten for 10 units. I now have 12 units which shared equally between 6 is 2. The answer is 62.'</p> <p><b>Decision making</b>                  "When you divide an even number by 3, you will always have a remainder."                  What do you think? Convince me.</p> <p>Is it always, sometimes or never true that an even number that is divisible by 3 is also divisible by 6?</p> <p>Is it always, sometimes or never true that the sum of four even numbers is divisible by 4?</p> <p><b>Representing problems</b>                  Alan says that the solution to <math>186 \div 4</math> can be written as '46 remainder 2' or as '46.5'. Do you agree? Explain your answer.</p>
With jottings... or in your head	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2 digit numbers times 1 digit numbers using mental methods. Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems (four times as high, eight times as long etc) and correspondence problems in which n objects are connected to m objects (12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).		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. Recognise and use factor pairs and commutativity in mental calculations.	
Known facts	Recall and use $\times$ and $\div$ facts for the 3, 4 and 8 x tables		Recall $\times$ and $\div$ facts for x tables up to $12 \times 12$ .	
Checking strategies	Estimate the answer to a calculation and use inverse operations to check answers. Develop efficient mental methods, for example, using commutativity and associativity ( $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$ or $4 \times 5 \times 12 = 4 \times 60 = 240$ ) and multiplication and division facts to derive related facts.		Practise mental methods and extend this to 3 digit numbers to derive facts, e.g. $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$ . Estimate and use inverse operations to check answers to a calculation. Approximate using the most significant digit, rounding skills.	
Essential	Review division facts (2 x, 5 x and	Halve 2 digit numbers	Division facts (4x and 8x tables)	10x smaller

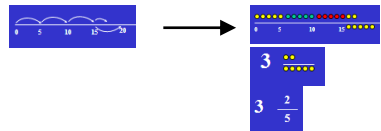
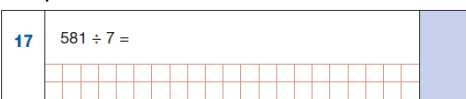
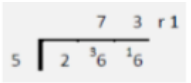
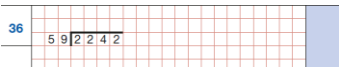
## Division KS2

knowledge	10 x tables)			
	Division facts (4 x table)	Division facts (3 x table)	Division facts (3 x, 6 x and 12 x tables)	Halve larger numbers and decimals
	Division facts (8 x table)	Division facts (6 x table)	Division facts (3 x and 9 x tables)	Division facts (11 x and 7 x tables)
Tests of divisibility	KS1: 2, 5, 10	Any number with a digit sum of a multiple of 3, will divide equally by 3	Any number with a digit sum of a multiple of 3, will divide equally by 3 KS1: 2, 5, 10	Any number with a digit sum of a multiple of 3 and is even will divide equally by 6

# Division KS2

Year	5	6
<p>Layers of vocabulary</p>  <p><b>Appendix 1a</b> Beck's Tiers of Vocabulary <b>Appendix 1b:</b> Vocabulary book</p>	<p><b>Basic to subject specific (Beck's Tiers):</b> equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse</p> <p><b>Instructional vocabulary:</b> calculate, work out, solve, investigate question, answer, check same, different missing number/s number facts, number pairs, number bonds greatest value, least value</p>	<p><b>Basic to subject specific (Beck's Tiers):</b> equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse, remainders as fractions or decimals</p> <p><b>Instructional vocabulary:</b> calculate, work out, solve, investigate question, answer, check same, different missing number/s number facts, number pairs, number bonds greatest value, least value</p>
<p>NC 2014</p>	<p>Divide numbers up to 4 digits by a 1 digit number using the formal written method of short division and interpret remainders appropriately for the context (as remainders, as fractions, as decimals or by rounding, e.g. <math>98 \div 4 = 24 \text{ r}2 = 24 \frac{1}{2} = 24.5 \approx 25</math>).</p> <p>Solve problems involving multiplication and division including using knowledge of factors and multiples, squares and cubes. Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates.</p>	<p>Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate to the context.</p> <p>Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.</p> <p>Solve problems involving addition, subtraction, multiplication and division.</p>

# Division KS2

<p>Developing Conceptual/ Procedural Understanding</p>	<p><b>Using known facts</b>          If <math>6 \div 2 = 3</math> then <math>6000 \div 2 = 3000</math> and <math>6000 \div 20 = 300</math></p> <p><b>Place value materials to represent calculations</b></p> <p><b>Short division</b>  <math>483 \div 7 =</math></p> $\begin{array}{r} 69r1 \\ 7 \overline{) 483} \end{array}$ <p>"484 divided by 7. 4 hundreds cannot be shared equally between 7, so exchange the hundreds for 40 tens. I now have 48 tens which shared equally between 7 is 6 with a remainder of 6 tens. Exchange the 6 tens for 60 units, we now have 64 units. 64 shared equally between 7 equals 9 remainder 1. The answer is 69 r1."</p>	<p><b>Interpreting remainders</b>  <math>17 \div 5</math>          "What do I know? 17 is not a multiple of 5."</p>  <p><math>3 \frac{2}{5} = 3.4</math></p> <p>From knowledge of decimal/fraction equivalents or by converting <math>\frac{2}{5}</math> into <math>\frac{4}{10}</math>.</p> <p><b>Decision making</b>          Children investigate alternative methods such as rearranging the standard written method, rearranging the dividend and partitioning and discuss when these might be most appropriate and efficient.          Examples:</p>  <p><math>581 \div 7 =</math></p> <p><math>581 \div 7</math> could be calculated by the formal written method of short division or it could be calculated by rearranging the dividend, using known facts, into 560 and 21.</p> <p><b>Representing problems</b>          Correct the errors in the calculation below. Explain the error. <math>266 \div 5 = 73.1</math></p> 	<p><b>Using known facts</b>          If <math>6 \div 2 = 3</math> then <math>6 \div 0.2 = 30</math> and <math>6 \div 0.02 = 300</math></p> <p><b>Short division</b>  <math>97.6 \div 5 =</math></p> $\begin{array}{r} 19.52 \\ 5 \overline{) 97.6} \end{array}$ <p>"97.6 divided by 5. 9 tens shared equally between 5 is 1 with a remainder of 4 tens. Exchange the ten for 10 units. I now have 47 units which shared equally between 5 is 9 with a remainder of 2 units. Exchange the 2 units for 20 tenths, we now have 26 tenths. 26 shared equally between 5 equals 5 with a remainder of 1 tenth. Extend the dividend with a 0 in the hundredths column. Exchange the tenth for 10 hundredths. 10 shared equally between 5 equals 2. The answer is 19.52."</p> <p><b>Long division</b>          (thinking not generally recorded)  <math>384 \div 16</math></p> <table border="1" data-bbox="1155 617 1281 730"> <tr><td>1</td><td>16</td></tr> <tr><td>2</td><td>32</td></tr> <tr><td>4</td><td>64</td></tr> <tr><td>5</td><td>80</td></tr> <tr><td>8</td><td>128</td></tr> <tr><td>10</td><td>160</td></tr> </table> <p>"What do I know about the divisor?"          Record partial tables.</p> $\begin{array}{r} 24 \\ 16 \overline{) 384} \\ \underline{-32} \phantom{0} \\ 64 \\ \underline{-64} \\ 0 \end{array}$ <p>(38 tens <math>\div 16 = 2</math> r6; <math>2 \times 16 = 32</math>)          (bring the 4 down)          (64 units <math>\div 16 = 4</math>)          (no remainder)</p>	1	16	2	32	4	64	5	80	8	128	10	160	 <p>With questions of this type where the divisor is close to a number linked to the times tables, encourage the children to use known facts and adjustment to set up the partial tables.</p> <table border="1" data-bbox="1554 341 1806 503"> <thead> <tr> <th></th> <th></th> <th>Adjust <math>\rightarrow</math></th> <th></th> </tr> </thead> <tbody> <tr><td>60</td><td>59</td><td></td><td></td></tr> <tr><td>120</td><td>118</td><td></td><td></td></tr> <tr><td>240</td><td>236</td><td></td><td></td></tr> <tr><td>300</td><td>295</td><td></td><td></td></tr> <tr><td>480</td><td>472</td><td></td><td></td></tr> <tr><td>600</td><td>590</td><td></td><td></td></tr> </tbody> </table> <p><b>Decision making</b>          Examples should be given where the calculation could be completed either by a short division or a long division method so that children can explore which is the most efficient method for them and/or where there are several different ways of recording the final answer e.g. <math>564 \div 13</math>  <math>564 \div 13 = 43</math> r5 = <math>43 \frac{5}{13} = 43.4</math> (to 1dp)          Decide how to record answer according to the context.          "When one number is divided by another the answer will always be smaller."          What do you think? Convince me.</p> <p><b>Representing problems</b>          Megan divides 500 by 8 and gets the answer 62r4. She re writes it as <math>62 \frac{1}{2}</math>. Is she right? Explain your answer.</p> <p><b>Using factors to simplify long division</b></p> $\begin{array}{r} 25 \overline{) 815} \\ \underline{50} \phantom{0} \\ 315 \\ \underline{250} \phantom{0} \\ 65 \\ \underline{50} \\ 15 \end{array}$ <p>Simplify the fractions for remainders</p>			Adjust $\rightarrow$		60	59			120	118			240	236			300	295			480	472			600	590		
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<p>With jottings... or in your head</p>	<p>Multiply and divide numbers mentally drawing upon known facts          Partition to multiply mentally          Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p>	<p>Perform mental calculations, including with mixed operations and large numbers          Use knowledge of the order of operations to carry out calculations involving the four operations (<math>2 + 1 \times 3 = 5</math> and <math>(2+1) \times 3 = 9</math>)          If appropriate- (Solve problems involving dividing, including using the</p>																																										

## Division KS2

		distributive law to divide 2 digit numbers by 1 digit ( $92 \div 4 = 80 \div 4 + 12 \div 4$ or $92 \div 4 = 100 \div 4 - 8 \div 4$ )		
Known facts	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Recall prime numbers up to 19	Identify common factors, common multiples and prime numbers		
Checking strategies	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. Promote decision making so that pupils choose an appropriate method/strategy.	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.		
Essential knowledge	Division facts (4 x and 8 x tables)	100, 1000 times smaller	Division facts up to 12 x 12	Halve larger numbers and decimals
	Division facts (3 x, 6 x and 12 x tables; 3 x and 9 x tables)	Partition to divide mentally	Apply place value to derive division facts, e.g. $12 \div 3 = 4$ so $1.2 \div 3 = 0.4$	Partition to divide mentally including decimals
	Division facts (11 x and 7 x tables)	Halve larger numbers and decimals		
Tests of divisibility	Tests for 2,3,5,6 &10	Any number with a digit sum of a multiple of 9 will divide equally by 9	Tests for 2,3,5,6, 9 & 10	Any number where the last two digits are divisible by 4, will all divide by 4