




Division KS2

KS1	<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>	
Year	3	4
<p>Layers of vocabulary</p>  <p>Appendix 1a Beck's Tiers of Vocabulary</p> <p>Appendix 1b: Vocabulary book</p>	<p>Basic to subject specific (Beck's Tiers): share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of \div, divide, division, divided by, divided into left, left over, remainder, dividend, divisor</p> <p>Instructional vocabulary: calculate, work out, solve, investigate question, answer, check</p>	<p>Basic to subject specific (Beck's Tiers): share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of \div, divide, division, divided by, divided into left, left over, remainder, dividend, divisor</p> <p>Instructional vocabulary: calculate, work out, solve, investigate question, answer, check</p>
NC 2014	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.	Practise to become fluent in the formal written method of short division with exact answers.




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Developing Conceptual/ Procedural Understanding	<p>Links to tables</p> <p>For example, use language of division linked to tables using counting stick</p> <p>Using known facts If $3 \times 2 = 6$, then $30 \times 2 = 60$, $60 \div 3 = 20$ and $30 = 60 \div 2$.</p> <p>Partitioning strategy to halve Halve 68</p> <p>Rearranging the dividend to find multiples of the divisor. $48 \div 3 =$ 'What do I know about the 3 x tables?' 'I know $3 \times 10 = 30$ and $3 \times 6 = 18$.' $48 \div 3 = 16$</p>	<p>Place value materials to represent calculations</p> <p>Short division $72 \div 3 =$</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>Representing problems Andy says 'I can use my three times table to work out $180 \div 3$'. Explain what Andy could do to work out this calculation.</p>	<p>Links to tables</p> <p>For example, use language of division linked to tables using counting stick</p> <p>Using known facts If $2 \times 3 = 6$ then $200 \times 3 = 600$ and $600 \div 3 = 200$</p> <p>Rearranging the dividend to find multiples of the divisor. $69 \div 3 =$ 'What do I know about the 3 x tables?' 'I know $3 \times 10 = 30$ and $3 \times 3 = 9$.' $69 \div 3 = 23$</p>	<p>Place value materials to represent calculations</p> <p>Short division $372 \div 6 =$</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>Representing problems Alan says that the solution to $186 \div 4$ can be written as '46 remainder 2' or as '46.5'. Do you agree? Explain your answer.</p>
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 12×12 .	
Essential knowledge	Review division facts (2 x, 5 x and 10 x tables)	Halve 2 digit numbers	Division facts (4x and 8x tables)	10x smaller
	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

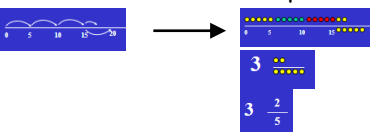

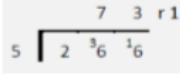
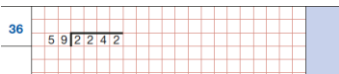


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Year	5	6
<p>Layers of vocabulary</p>  <p>Appendix 1a Beck's Tiers of Vocabulary Appendix 1b: Vocabulary book</p>	<p>Basic to subject specific (Beck's Tiers): equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse</p> <p>Instructional vocabulary: 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>Basic to subject specific (Beck's Tiers): equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse, remainders as fractions or decimals</p> <p>Instructional vocabulary: 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. $98 \div 4 = 24 \text{ r}2 = 24 \frac{1}{2} = 24.5 \approx 25$).</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>



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<p>Developing Conceptual/ Procedural Understanding</p>	<p>Using known facts If $6 \div 2 = 3$ then $6000 \div 2 = 3000$ and $6000 \div 20 = 300$</p> <p>Place value materials to represent calculations</p> <p>Short division $483 \div 7 =$</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>Interpreting remainders $17 \div 5$ "What do I know? 17 is not a multiple of 5."</p>  <p>$3 \frac{2}{5} = 3.4$</p> <p>From knowledge of decimal/fraction equivalents or by converting $\frac{2}{5}$ into $\frac{4}{10}$.</p> <p>Examples:</p> $17 \quad 581 \div 7 =$  <p>$581 \div 7$ 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>Representing problems Correct the errors in the calculation below. Explain the error. $266 \div 5 = 73.1$</p> 	<p>Using known facts If $6 \div 2 = 3$ then $6 \div 0.2 = 30$ and $6 \div 0.02 = 300$</p> <p>Short division $97.6 \div 5 =$</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>Long division (thinking not generally recorded) $384 \div 16$</p> <table border="1" style="margin-left: 20px;"> <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> $\begin{array}{r} 24 \\ 16 \overline{) 384} \\ \underline{-32} \\ 64 \\ \underline{-64} \\ 0 \end{array}$ <p>(38 tens $\div 16 = 2$ r6; $2 \times 16 = 32$) (bring the 4 down) (64 units $\div 16 = 4$) (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" style="margin-left: 20px;"> <thead> <tr><th></th><th>60</th><th>Adjust</th><th>59</th></tr> </thead> <tbody> <tr><td>1</td><td>120</td><td>2</td><td>118</td></tr> <tr><td>2</td><td>240</td><td>4</td><td>236</td></tr> <tr><td>3</td><td>300</td><td>6</td><td>295</td></tr> <tr><td>4</td><td>480</td><td>8</td><td>472</td></tr> <tr><td>5</td><td>600</td><td>10</td><td>590</td></tr> </tbody> </table> <p>Representing problems Megan divides 500 by 8 and gets the answer 62r4. She re writes it as $62 \text{ r } 1/2$. Is she right? Explain your answer.</p> <p>Using factors to simplify long division</p> $25 \overline{) 815}$ $\begin{array}{r} 165 \\ 5 \overline{) 815} \\ \underline{5} \\ 35 \\ \underline{35} \\ 0 \end{array}$ <p>Simplify the fractions for remainders</p>		60	Adjust	59	1	120	2	118	2	240	4	236	3	300	6	295	4	480	8	472	5	600	10	590
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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																																					
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																																				



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