
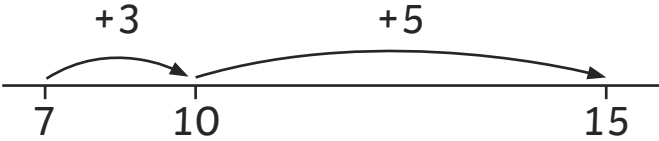
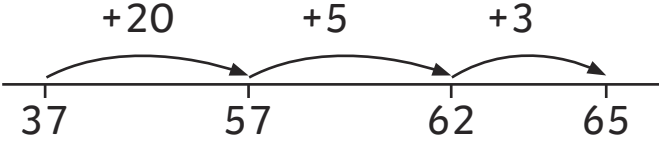


Calculation Methods

Addition

The different stages	Examples
<p>Stage 1 Counting sets of objects</p>	
<p>Stage 2 Combining two sets of objects into one group and counting practically.</p>	<p>For $5 + 3$ the children may get 5 objects, and then 3 more and count how many altogether.</p>
<p>Stage 3 Drawing dots - informal jottings. Then counting how many altogether.</p>	<p>$3 + 5 = 8$</p> <p>• • • + • • • • •</p>
<p>Stage 4 Counting on, on a number line with numbers on it.</p>	<p>$5 + 3 = 8$</p> 
<p>Stage 5 Steps in addition can be recorded on a number line. The steps often bridge through a multiple of 10.</p> <p>1) Partition the smaller numbers into tens and ones. 2) Add on the tens. 3) Add on the ones.</p>	<p>$7 + 8 = 15$</p>  <p>$37 + 28 = 65$</p> 


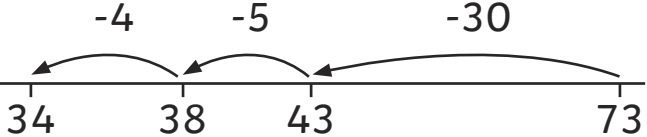
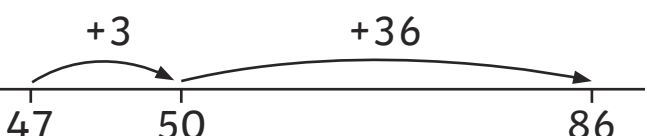
Calculation Methods

Addition

The different stages	Examples
Stage 6 Partitioned numbers are then written under one another.	$\begin{array}{r} 87 \\ + 20 \\ \hline \end{array}$ $\begin{array}{r} 80 + 7 \\ 20 + 8 \\ \hline 100 + 15 = 115 \end{array}$
Stage 7 Write the numbers in columns Add the tens first.	$\begin{array}{r} 87 \\ + 28 \\ \hline 100 \\ 15 \\ \hline 115 \end{array}$
Adding the units first.	$\begin{array}{r} 87 \\ + 28 \\ \hline 15 \\ 100 \\ \hline 115 \end{array}$
Stage 8 This then becomes the shorter method where numbers get carried into the next column.	$\begin{array}{r} 87 \\ + 28 \\ \hline 115 \\ \hline 11 \end{array}$
Stage 9 Later, move to adding three two digit numbers, two three digit numbers and numbers with amounts of digits.	$\begin{array}{r} 249 \\ + 96 \\ \hline 345 \\ \hline 11 \end{array}$

Calculation Methods

Subtraction

The different stages	Examples
<p>Stage 1</p> <p>Practically get a group of objects together and then take some away.</p>	
<p>Stage 2</p> <p>Jottings - draw a set of marks, and then cross some out.</p>	<p>$12 - 5 = 7$</p> <p>✕ ✕ ✕ ✕ ✕ ● ● ● ● ● ● ● ●</p>
<p>Stage 3</p> <p>Count back on a number line with numbers already on it.</p>	<p>$12 - 3 = 9$</p> 
<p>Stage 4</p> <p>Using a number line.</p> <p>Work by counting back.</p> <p>Also work out the difference by counting on.</p>	<p>$73 - 39 = 34$</p>  <p>Work out the difference between 47 and 86 = 39</p> 



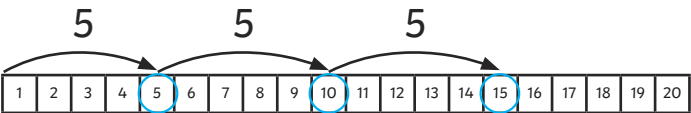
Calculation Methods

Subtraction

The different stages	Examples
<p>Stage 5</p> <p>Partitioned numbers are written under one another. This is how we start introducing the column subtraction method.</p>	$77 - 25 =$ $\begin{array}{r} 70 + 7 \\ -20 + 5 \\ \hline 50 + 2 = 52 \end{array}$
<p>Stage 6</p> <p>(Replace with 2 digit numbers) These show the two steps that lead to the shortened version of the column subtraction method. Always start with the units number.</p>	$73 - 26 =$ $\begin{array}{r} 70 + 3 \\ -20 + 6 \\ \hline 40 + 7 \end{array}$ <p style="text-align: center;">(split 77)</p> $\begin{array}{r} 60 \quad 13 \\ \cancel{70} + \cancel{3} \\ -20 + 6 \end{array} \rightarrow \begin{array}{r} 6 \quad 13 \\ \cancel{73} \\ -26 \\ \hline 47 \end{array}$
<p>Stage 7</p> <p>(Replace with 3 digit numbers) These show the two steps that lead to the shortened version of the column subtraction method. Always start with the units number.</p>	$652 - 475 =$ $\begin{array}{r} 600 + 50 + 2 \\ -400 + 70 + 5 \\ \hline 100 + 70 + 7 \end{array}$ $\begin{array}{r} 500 \quad 140 \quad 12 \\ \cancel{600} + \cancel{50} + \cancel{2} \\ -400 + 70 + 5 \\ \hline 100 + 70 + 7 \end{array}$ $\begin{array}{r} 5 \quad 14 \quad 12 \\ \cancel{6} \cancel{5} \cancel{2} \\ -4 \quad 7 \quad 5 \\ \hline 1 \quad 7 \quad 7 \end{array}$
<p>Stage 8</p> <p>(Replace with 4 digit numbers including 0)</p>	$\begin{array}{r} 5000 \quad 900 \quad 100 \quad 5 \quad 9 \quad 10 \\ \cancel{6000} + \cancel{000} + \cancel{00} + 9 \quad \cancel{6000} + \cancel{000} + \cancel{00} + 9 \\ -2000 + 100 + 20 + 3 \rightarrow -2123 \\ \hline 3000 + 800 + 80 + 6 \quad 3886 \end{array}$

Calculation Methods

Multiplication

<p>Year 2 2 times table 5 times table 10 times table</p>	<p>Within this teach how to know facts i.e. 6×3 is 5×3 and then 1×3 9×3 is 10×3 and then take away 3</p>
<p>Year 3 3 times table 4 times table 5 times table 5 times table</p>	
<p>Year 4 Derive and recall multiplication facts for all tables up to 10×10.</p>	
The different stages	Examples
<p>Stage 1 Counting practically in repeated groups/patterns.</p>	
<p>Stage 2 Grouping</p>	<p>$4 \times 2 = 8$</p> 
<p>Stage 3 Arrays</p>	<p>$4 \times 2 = 8$ or $2 \times 4 = 8$</p> 
<p>Stage 3 Repeated addition Repeated addition can be shown easily on a number line.</p>	<p>5×3 is $5 + 5 + 5 = 15$ or 3 lots of 5</p> 

Calculation Methods

Multiplication

The different stages	Examples																	
<p>Stage 5 Partitioning</p>	$14 \times 6 =$ $10 \times 6 = 60$ $4 \times 6 = 24$ $60 + 24 = 84$																	
<p>Stage 6 The grid method</p> <p>Place the number with the most digits in the left-hand column so that it is easier to add the answers of each part of the multiplication together.</p>	$37 \times 8 =$ <table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">x</td> <td style="padding: 5px;">8</td> <td style="border-top: 1px solid black; border-left: 1px solid black; border-right: 1px solid black;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">30</td> <td style="padding: 5px;">240</td> <td style="border-top: 1px solid black; border-left: 1px solid black; border-right: 1px solid black;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">7</td> <td style="padding: 5px;">56</td> <td style="border-top: 1px solid black; border-left: 1px solid black; border-right: 1px solid black;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">296</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	x	8		30	240		7	56			296						
x	8																	
30	240																	
7	56																	
	296																	
<p>Stage 7 Long multiplication</p> <p>The next step is to show the method of recording in a column format, but showing the working. This links to the grid method above.</p> <p>Children should describe what they do by saying the actual values of the digits in the column. E.g. The first step in 37×8 is 'thirty multiplied by eight', not 'three times eight.'</p>	<table style="margin-left: 20px;"> <tr> <td style="text-align: right;">$30 + 7$</td> <td></td> </tr> <tr> <td style="text-align: right;">$\underline{ \times 8}$</td> <td></td> </tr> <tr> <td style="text-align: right;">$ 240$</td> <td style="padding-left: 20px;">$30 \times 8 = 240$</td> </tr> <tr> <td style="text-align: right;">$ 56$</td> <td style="padding-left: 20px;">$8 \times 7 = 56$</td> </tr> <tr> <td style="text-align: right;">$\underline{ 296}$</td> <td></td> </tr> </table> <table style="margin-left: 20px;"> <tr> <td style="text-align: right;">$ 37$</td> <td rowspan="4" style="padding-left: 20px; vertical-align: middle;">This is the slightly shorter version.</td> </tr> <tr> <td style="text-align: right;">$\underline{ \times 8}$</td> </tr> <tr> <td style="text-align: right;">$ 240$</td> </tr> <tr> <td style="text-align: right;">$\underline{ 56}$</td> </tr> <tr> <td style="text-align: right;">$ 296$</td> <td></td> </tr> </table>	$30 + 7$		$\underline{ \times 8}$		$ 240$	$30 \times 8 = 240$	$ 56$	$8 \times 7 = 56$	$\underline{ 296}$		$ 37$	This is the slightly shorter version.	$\underline{ \times 8}$	$ 240$	$\underline{ 56}$	$ 296$	
$30 + 7$																		
$\underline{ \times 8}$																		
$ 240$	$30 \times 8 = 240$																	
$ 56$	$8 \times 7 = 56$																	
$\underline{ 296}$																		
$ 37$	This is the slightly shorter version.																	
$\underline{ \times 8}$																		
$ 240$																		
$\underline{ 56}$																		
$ 296$																		
<p>Stage 8 Short multiplication.</p> <p>The next step involves adding 240 and 56 mentally with only the 5 in the 56 recorded.</p>	<table style="margin-left: 20px;"> <tr> <td style="text-align: right;">$ 37$</td> </tr> <tr> <td style="text-align: right;">$\underline{ \times 8}$</td> </tr> <tr> <td style="text-align: right;">$ 296$</td> </tr> <tr> <td style="text-align: right;">$ 5$</td> </tr> </table>	$ 37$	$\underline{ \times 8}$	$ 296$	$ 5$													
$ 37$																		
$\underline{ \times 8}$																		
$ 296$																		
$ 5$																		

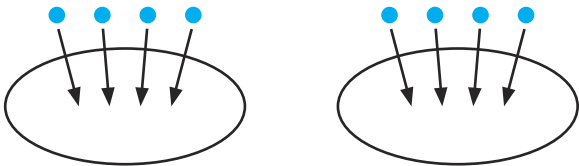

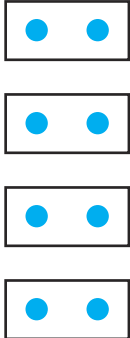
Calculation Methods

Multiplication

The different stages	Examples																
<p>Stage 9</p> <p>Multiplying two, two digit numbers. This follows the same steps as the first grid method but for 2 digit numbers.</p>	47×23 <table border="1" style="margin-left: 20px;"> <tr> <td>x</td> <td>20</td> <td>3</td> <td></td> </tr> <tr> <td>40</td> <td>800</td> <td>120</td> <td>920</td> </tr> <tr> <td>7</td> <td>140</td> <td>21</td> <td>161</td> </tr> <tr> <td></td> <td></td> <td></td> <td>1081</td> </tr> </table>	x	20	3		40	800	120	920	7	140	21	161				1081
x	20	3															
40	800	120	920														
7	140	21	161														
			1081														
<p>Stage 10</p> <p>The amount of recording is reduced but children still need to follow each step of the grid method.</p>	<p>47×23 is approximately 50×20 is 1000</p> <table style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">$\begin{array}{r} 47 \\ \times 23 \\ \hline 140 \\ 800 \\ 21 \\ \hline 120 \\ \hline 1081 \end{array}$</td> <td> $20 \times 7 = 140$ $20 \times 40 = 800$ $3 \times 7 = 120$ $3 \times 40 = 120$ </td> </tr> </table>	$\begin{array}{r} 47 \\ \times 23 \\ \hline 140 \\ 800 \\ 21 \\ \hline 120 \\ \hline 1081 \end{array}$	$20 \times 7 = 140$ $20 \times 40 = 800$ $3 \times 7 = 120$ $3 \times 40 = 120$														
$\begin{array}{r} 47 \\ \times 23 \\ \hline 140 \\ 800 \\ 21 \\ \hline 120 \\ \hline 1081 \end{array}$	$20 \times 7 = 140$ $20 \times 40 = 800$ $3 \times 7 = 120$ $3 \times 40 = 120$																
<p>The amount of recording is reduced more.</p>	<p>47×23 is approximately 50×20 is 1000</p> <table style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">$\begin{array}{r} 47 \\ \times 23 \\ \hline 940 \\ 141 \\ \hline 1081 \end{array}$</td> <td> 47×20 47×3 </td> </tr> </table>	$\begin{array}{r} 47 \\ \times 23 \\ \hline 940 \\ 141 \\ \hline 1081 \end{array}$	47×20 47×3														
$\begin{array}{r} 47 \\ \times 23 \\ \hline 940 \\ 141 \\ \hline 1081 \end{array}$	47×20 47×3																

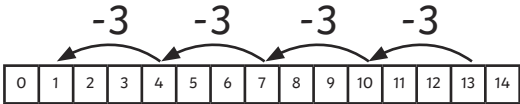
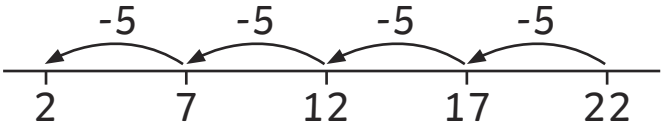
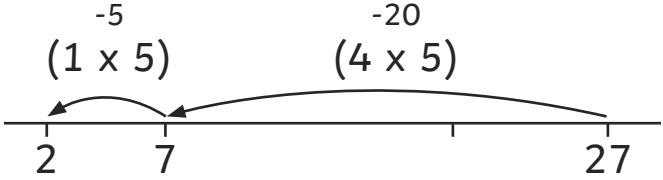
Calculation Methods

Division

Deriving and recalling division facts		
Year 2 2 times table 5 times table 10 times table	Year 3 3 times table 4 times table 6 times table	Year 4 Derive and recall all division facts for all tables up to 10×10 .
The different stages	Examples	
<p>Stage 1</p> <p>Children will develop their understanding of division and use jottings to support calculation.</p>	<p>$8 \div 2$</p> <p>Sharing equally</p> <p>8 sweets shared between 2 people, how many do they each get?</p> 	
<p>Stage 2</p> <p>Grouping</p>	<p>Grouping or repeated addition</p> <p>There are 8 sweets, how many people can have 2 sweets each?</p> 	
<p>Stage 3</p> <p>Arrays</p>	<p>Arrays can also be used.</p> 	
<p>Stage 4</p> <p>Repeated addition</p> <p>Repeated addition can be shown easily on a number line.</p>		

Calculation Methods

Division

The different stages	Examples
<p>Stage 2</p> <p>Children should also move onto calculations involving remainders through repeated subtraction.</p>	<p>$13 \div 3 = 4r1$</p> 
<p>Stage 3</p> <p>Children will develop their use of repeated subtraction to be able to subtract multiples of the divisor. Initially this should be multiples of 10, 5, 2 and 1 - numbers with which the children are more familiar.</p>	<p>$22 \div 5 = 4r2$</p> 
<p>Stage 4</p> <p>Moving onto:</p>	<p>$27 \div 5 = 5r2$</p> 
<p>Stage 5</p> <p>Tens Ones + Ones The vertical method. (Also known as chunking)</p>	<p>$72 \div 3 =$</p> $\begin{array}{r} 3 \overline{) 72} \\ \underline{- 30} \quad (10 \times 3) \\ 42 \\ \underline{- 30} \quad (10 \times 3) \\ 12 \\ \underline{- 6} \quad (2 \times 3) \\ 6 \\ \underline{- 6} \quad (2 \times 3) \quad 10 + 2 + 2 + 2 \\ 0 \end{array}$ <p>$= 24$</p>

Calculation Methods

Division

The different stages	Examples
<p>Stage 6</p> <p>Hundreds Tens Ones + Ones Introduce subtracting larger multiples of ten. This is called chunking.</p>	<p>$289 \div 8$</p>
<p>Stage 7</p> <p>Long division. Hundreds Tens Ones + Ones</p>	<p>How many packs of 36 can we make from 828 biscuits?</p> <p>Start by multiplying 36 by multiples of 10 to get an estimate. As 36×20 is 720 and 36×30 is 1080 so we know it is between 20 and 30 packs. We start by subtracting 720 from 828.</p> $\begin{array}{r} 36 \overline{)828} \\ - 720 \quad (36 \times 20) \\ \hline 108 \\ - 108 \quad (36 \times 3) \\ \hline 0 \end{array}$ <p>Answer= 23</p> <p>In effect, the recording above is the long division method, though conventionally the digits of the answer are recorded above the line as shown.</p> $\begin{array}{r} 23 \\ 36 \overline{)828} \\ - 720 \\ \hline 108 \\ - 108 \\ \hline 0 \end{array}$

Calculation Methods

These are the calculation strategies used by most UK primary schools for maths. They are in stages rather than age groups as children develop mathematically at different ages. To establish which stage your child is working on, you can either ask your child's teacher or simply ask your child to carry out a related activity, for example by adding two numbers together. Just because your child is on a certain stage for one operation does not mean they will be on the same stage for others.

When your child is really confident with a stage then move them forward and start working on the next stage.