



St Mary's Catholic Primary School's Calculation



These are the methods which we use to teach addition. Although the stages are assigned to year groups, this very much depends on the child's level of understanding and therefore they will work on a method that is suitable for them. The images for all methods are repeatedly used from R to Year 6 to help consolidate understanding.

U = units T = tens H = hundreds		
Stage 1 Reception	Counting sets of objects or pictures of objects reliably.	Starting off by counting how many objects in 1 group by pointing with their finger whilst counting out loud.
Stage 2 Reception	Combining 2 sets of objects into 1 group and counting practically.	So for $6 + 2 = \square$ the child may get 6 cubes and then 2 more and then count how many altogether.
Stage 3 Reception	Drawing pictures/dots (informal jottings) then counting how many altogether.	$4 + 2 = 6$ $* * * * + * *$
Stage 4 Year 1	Counting on using a marked number line.	$7 + 5 = 12$
Stage 5 Year 1	Counting on using a blank number line and jump sizes of the child's choosing – starting on the largest number.	$8 + 26 = 34$
Stage 6 Year 1	Partitioning the smaller number into T and U to count on an empty number line – starting on the largest number.	$26 + 48 = 74$ $20 \quad 6$

Stage 7 Year 1 and 2	Partitioning the smaller number into T and U and then counting on mentally, recording each stage.	$32 + 56 = 88$ $56 + 32$ $56 + 30 = 86$ $86 + 2 = 88$
Stage 8 Year 2	Expanded column method – partitioning the numbers and starting with the H	$137 + 152 = 289$ $100 + 30 + 7$ $100 + 50 + 2$ <hr/> $200 + 80 + 9$ <hr/> 289
Stage 9 Year 3	Expanded column method – partitioning the numbers to then add starting with the U.	$\begin{array}{r} 246 \\ +178 \\ \hline 14 \\ 110 \\ 300 \\ \hline 424 \end{array}$
Stage 10 Year 3	Compact column method where digits are carried to the next column – calculating should naturally start at the U	$\begin{array}{r} 246 \\ +178 \\ \hline 424 \end{array}$
Stage 11 Year 4 and 5	Compact column method, starting at U using 4 and 5 digit numbers.	$\begin{array}{r} 2246 \\ +4178 \\ \hline 6424 \end{array}$
Stage 12 Year 5	Compact column method, starting at U using more than two numbers, decimals or larger 5 digit+ numbers	$\begin{array}{r} \pounds 4.67 \\ + \pounds 2.46 \\ + \pounds 1.35 \\ \hline \pounds 58.48 \\ \hline \end{array}$


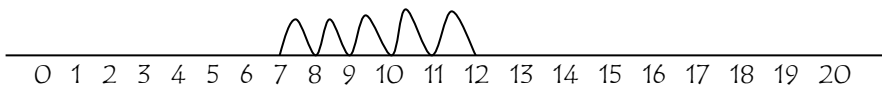
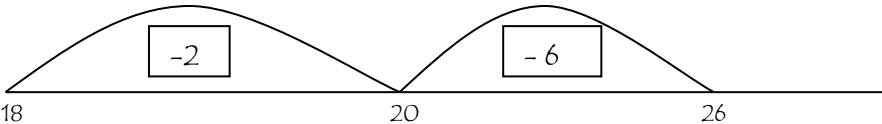
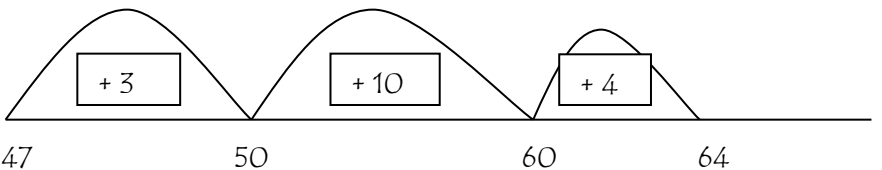
Stage 12 Year 5/6	By year 5/6 children should have developed the full range of methods so that they can move on to choosing suitable methods for a wide variety of maths										
Vocabulary for addition	<table border="0"><tr><td>addition</td><td>altogether</td><td>sum of</td><td>plus</td><td>add</td></tr><tr><td></td><td>total</td><td></td><td></td><td></td></tr></table>	addition	altogether	sum of	plus	add		total			
addition	altogether	sum of	plus	add							
	total										



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These are the methods which we use to teach subtraction. Although the stages are assigned to year groups, this very much depends on the child's level of understanding and therefore they will work on a method that is suitable for them. The images for all methods are repeatedly used from R to Year 6 to help consolidate understanding.

Stage 1 Reception	Practically getting a set of objects or pictures of objects and then taking some away.	Can you take away 3 from this group? Here are 7 cubes, can you take away 4?
Stage 2 Reception	Practically taking away objects and counting how many are left.	So for $6 - 2 = \square$ the child may get 6 cubes and then take away 2 cubes and then count how many left.
Stage 3 Reception/ Year 1	Drawing pictures/dots (informal jottings) then crossing out the number to take away and then counting how many are left.	$6 - 2 = 4$ 
Stage 4 Year 1	Counting back using a marked number line. Starting to look practically at finding the difference – using objects like cubes.	<div style="text-align: center;"> $12 - 5 = 7$  </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="display: flex; gap: 5px;"> </div> <div style="display: flex; gap: 5px; margin-top: 5px;"> </div> <div style="border: 1px solid black; padding: 5px; margin-left: auto; margin-right: auto; width: fit-content;"> What is the difference between 7 and 4? </div> </div>
Stage 5 Year 1 and 2	Counting back using a blank number line and jump sizes of the child's choosing. Starting to look at finding the difference using an empty number line and counting on from the smallest number in steps of the child's choosing. They	<div style="text-align: center;"> $26 - 8 = 18$  </div> <div style="text-align: center; margin-top: 10px;"> $64 - 47 = 17$  </div>

	then add the numbers in the bridges.	
Stage 6 Year 2	Partitioning the smaller number into T and U to count back on an empty number line.	$74 - 26 = 48$
Stage 7 Year 2	Expanded column method – partitioning the numbers and starting with the H	$357 - 132 = 25$ $300 + 50 + 7$ $100 + 30 + 2$ <hr/> $200 + 20 + 5$ <hr/> 25
Stage 8 Year 3	Partitioning the numbers and arranging them in the column – using sharing to show how the next stage of the column method works.	$74 - 27 = 47$ $70 + 4$ $- 20 + 7$ <hr/> $40 + 7 = 47$ $741 - 367 = 374$ $700 + 40 + 1$ $- 300 + 60 + 7$ <hr/> $300 + 70 + 4 = 374$
Stage 9 Year 4	Column method – starting with the U.	$\begin{array}{r} 136 \\ \cancel{2}46 \\ -178 \\ \hline 68 \end{array}$
Stage 10 Year 5 and 6	By year 6 children should have developed the full range of methods so that they can move on to choosing suitable methods for a wide variety of maths.	

Vocabulary
for
subtraction

subtraction

take away

difference

how many more than

how many left

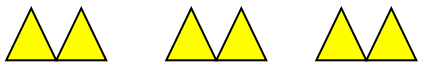

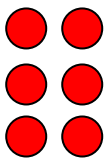
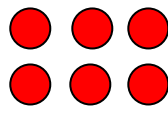
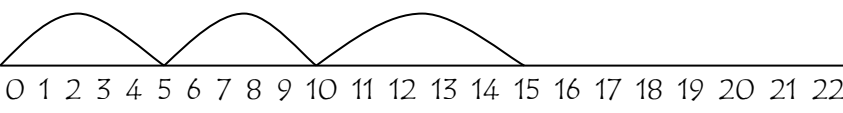
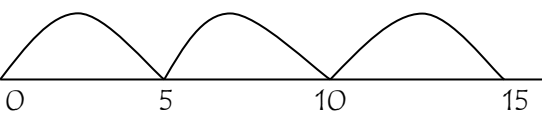
how many more needed



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These are the methods which we use to teach multiplication. Although the stages are assigned to year groups, this very much depends on the child's level of understanding and therefore they will work on a method that is suitable for them. The images for all methods are repeatedly used from R to Year 6 to help consolidate understanding.

Learning the times tables	<p>By end of Year 2 to be able to recite: x2, x5, x10, x9, x11</p> <p>By end of Year 4 to be able to recite: x3, x4, x6, x7, x8, x12</p> <p>Ideally, children should know the times tables up to 12 x 12 before entering Year 5 so that they focus on more in depth maths rather than getting stuck on times tables e.g working on fractions of amounts and then getting stuck on the 6 times table.</p>
Stage 1 Reception	<p>Counting practically in repeated groups.</p> <p>A child may be presented with 5 groups of 2, they would be asked how many each each group (2) and how many altogether.</p>
Stage 2 Year 1	<p style="text-align: center;">$3 \times 2 = 6$</p> <div style="display: flex; justify-content: space-around; align-items: center;">  = 6 </div> <p style="text-align: center;">OR</p> <div style="display: flex; justify-content: space-around; align-items: center;">  = 6 </div> <p>At this stage children can record this calculation in either of the two ways described above as they build the understanding that multiplication (like addition) can be done in any order.</p>
Stage 3 Year 1 & 2	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>$3 \times 2 = 6$</p>  <p>$3 + 3 = 6$</p> </div> <div style="text-align: center;"> <p>$2 \times 3 = 6$</p>  <p>$2 + 2 + 2 = 6$</p> </div> </div>
Stage 4 Year 2	<p>$5 \times 3 = 15$ $(5 + 5 + 5)$</p>  <p style="text-align: center;">THEN</p> <p>Repeating the same on an empty number line</p> 

Once children enter into Year 3 they shall be taught that 3×2 means the number 3 two times. Therefore 2×3 means the number 2 three times. This understanding is important as it leads on to understanding sequences of calculations in higher maths once into KS3 and KS4.

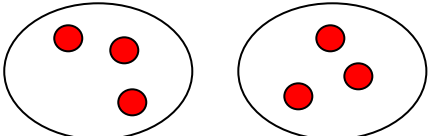
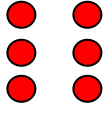
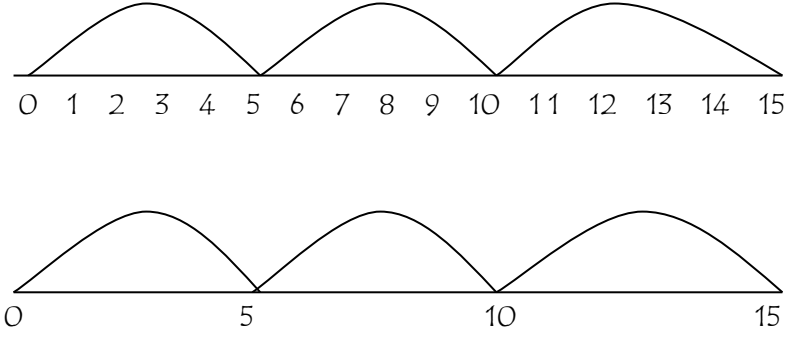
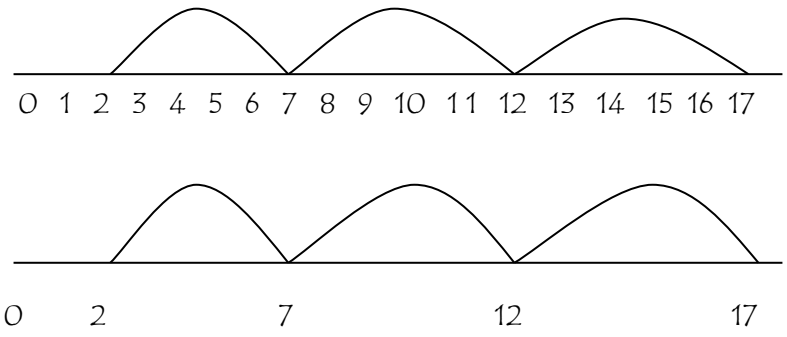
<p>Stage 5 Year 3</p>	<p>At this stage children need to understand the effect of multiplying a number by 10 and 100. Even though they will be taught to add a place holder/s at the end of the number they will be shown why this is.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $13 \times 10 = 130$ <table style="margin: 0 auto;"> <tr><td>H</td><td>T</td><td>U</td></tr> <tr><td>←</td><td>1</td><td>3</td></tr> <tr><td>1</td><td>3</td><td>0</td></tr> </table> </div> <div style="text-align: center;"> $13 \times 100 = 1300$ <table style="margin: 0 auto;"> <tr><td>Th</td><td>H</td><td>T</td><td>U</td></tr> <tr><td>←</td><td>1</td><td>3</td><td></td></tr> <tr><td>1</td><td>3</td><td>0</td><td>0</td></tr> </table> </div> </div> <p>Understanding of this is crucial to help with the partitioning method in the next stage.</p>	H	T	U	←	1	3	1	3	0	Th	H	T	U	←	1	3		1	3	0	0
H	T	U																					
←	1	3																					
1	3	0																					
Th	H	T	U																				
←	1	3																					
1	3	0	0																				
<p>Stage 6 Year 3/4</p>	<p>Partitioning the numbers enables children to see how the method in the next stage is built up.</p>	<div style="text-align: center;"> $15 \times 3 = 45$ </div>																					
<p>Stage 7 Year 4/5</p>	<p>Long multiplication - children should describe what they do by saying the actual values of the digits in the columns. For example, the second step in 38×7 is 'thirty multiplied by seven', not 'three times seven'.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 38 \\ \times 7 \\ \hline 56 \text{ (} 8 \times 7 \text{)} \\ 210 \text{ (} 30 \times 7 \text{)} \\ \hline 266 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 56 \\ \times 27 \\ \hline 42 \text{ (} 6 \times 7 \text{)} \\ + 350 \text{ (} 50 \times 7 \text{)} \\ \hline 120 \text{ (} 6 \times 20 \text{)} \\ 1000 \text{ (} 50 \times 20 \text{)} \\ \hline 1512 \end{array}$ </div> </div>																					
<p>Stage 8 Year 6</p>	<p>In Year 6 the children will learn how to record short and long multiplication in a formal way without the necessary expanding of partitioning.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \end{array}$ </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>This requires adding the 210 made by 30×7 to the 50 recorded by the 5.</p> </div> <div style="text-align: center;"> $\begin{array}{r} 56 \\ \times 27 \\ \hline 392 \\ \hline 1120 \\ \hline 1512 \end{array}$ </div> </div>																					
<p>Vocabulary for multiplication</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px;">groups of</div> <div style="border: 1px solid black; padding: 5px;">lots of</div> <div style="border: 1px solid black; padding: 5px;">repeated addition</div> <div style="border: 1px solid black; padding: 5px;">times</div> <div style="border: 1px solid black; padding: 5px;">arrays</div> <div style="border: 1px solid black; padding: 5px;">multiplied by</div> <div style="border: 1px solid black; padding: 5px;">product</div> </div>																						



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These are the methods which we use to teach division. Although the stages are assigned to year groups, this very much depends on the child's level of understanding and therefore they will work on a method that is suitable for them. The images for all methods are repeatedly used from R to Year 6 to help consolidate understanding.

<p>Stage 1 Reception</p>	<p>Sharing out objects practically.</p>	<p>A child might be given 10 cubes and asked to share them out between the 5 bears. They would do this by giving one cube to each bear and then repeating this action until all cubes have been shared out. They then count how many cubes the bears have – recognising that they have an equal amount which is fair.</p>
<p>Stage 2 Year 1</p>	<p>Children start to look at the symbol for division with the understanding that it means sharing and then using grouping to help calculate. They would do this practically then recorded as so.</p>	$6 \div 2 = 3$ 
<p>Stage 3 Year 1 and 2</p>	<p>Children will be looking at arrays at this stage for multiplication and so they can form the same for division.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>The children need to start off by putting the start of 2 groups and then continue sharing between each group as they count to 6. They then count how many in each group.</p> </div> <div style="display: inline-block; vertical-align: middle; margin-left: 20px;"> $\div 2 = 3$  </div>
<p>Stage 4 Year 2</p>	<p>Using knowledge of repeated subtraction to show division on a marked number line.</p> <p style="text-align: center;">THEN</p> <p>Repeating the same on an empty number line</p>	<p style="text-align: center;">$15 \div 5 = 3$</p> 
<p>Stage 5 Year 2</p>	<p>Children will look at how to record remainders in division.</p>	<p style="text-align: center;">$17 \div 5 = 3 \text{ r } 2$</p> 

<p>Stage 6 Year 3</p>	<p>Children will start to record their subtractions in a vertical manner.</p> <p>Children will already know what remainders are and how to record them.</p>	$ \begin{array}{r} 3 \overline{) 72} \\ \underline{-30} \quad (3 \times 10) \\ 42 \\ \underline{-30} \quad (3 \times 10) \\ 12 \\ \underline{-6} \quad (3 \times 2) \\ 6 \\ \underline{-6} \quad (3 \times 2) \\ 0 \end{array} $ <p>Answer = 24</p>
<p>Stage 7 Year 4 and 5</p>	<p>Children will be calculating $HTU \div U$ using the previous method and refining this for methods of short division $HTU \div T$</p>	$ \begin{array}{r} 362 \div 7 = \\ \quad \quad \quad 51 \text{ r}5 \\ 7 \overline{) 362} \\ \underline{35} \\ 12 \\ \underline{7} \\ 5 \end{array} $ <p>$362 \div 7 = 51 \text{ r}5$</p>
<p>Stage 8 Year 5 and 6</p>	<p>Children will move on to long division for $HTU \div TU$.</p>	$ \begin{array}{r} 2191 \\ 4 \overline{) 8764} \\ \underline{8} \\ 07 \\ \underline{4} \\ 36 \\ \underline{36} \\ 04 \\ \underline{4} \\ 0 \end{array} \qquad \begin{array}{r} 21 \\ 216 \overline{) 4536} \\ \underline{432} \\ 216 \\ \underline{216} \\ 0 \end{array} \qquad \begin{array}{r} 17 \text{ r} 19 \\ 31 \overline{) 546} \\ \underline{31} \\ 236 \\ \underline{217} \\ 19 \end{array} $
<p>Vocabulary for division</p>	<div style="display: flex; flex-wrap: wrap; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">share</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">how many groups</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">how many lots of</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">dividend</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">divisor</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">array</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">repeated subtraction</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">divide</div> </div> <p><i>Please note, at KS2 we use the correct terminology for the methods we are learning (short division, long division, arrays, repeated subtraction etc) as opposed to 'Bus Stop', 'Dave the Dividing Dog' etc</i></p>	