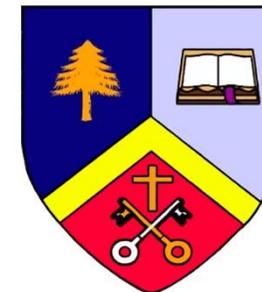




St Peter's C of E Junior School



Progression in Calculation Policy

LOWER KS2

KEY STAGE 2

In Years 3 and 4, children develop the basis of written methods by building their skills alongside a deep understanding of place value. They should use known addition/subtraction and multiplication/division facts to calculate efficiently and accurately, rather than relying on counting. Children use place value equipment to support their understanding, but not as a substitute for thinking.

Key language: partition, place value, tens, hundreds, thousands, column method, whole, part, equal groups, sharing, grouping, bar model

Addition and subtraction: In Year 3 especially, the column methods are built up gradually. Children will develop their understanding of how each stage of the calculation, including any exchanges, relates to place value. The example calculations chosen to introduce the stages of each method may often be more suited to a mental method. However, the examples and the progression of the steps have been chosen to help children develop their fluency in the process, alongside a deep understanding of the concepts and the numbers involved, so that they can apply these skills accurately and efficiently to later calculations. The class should be encouraged to compare mental and written methods for specific calculations, and children should be encouraged at every stage to make choices about which methods to apply.

In Year 4, the steps are shown without such fine detail, although children should continue to build their understanding with a secure basis in place value. In subtraction, children will need to develop their understanding of exchange as they may need to exchange across one or two columns. By the end of Year 4, children should have developed fluency in column methods alongside a deep understanding, which will allow them to progress confidently in upper Key Stage 2.

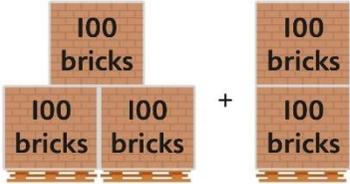
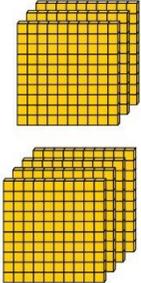
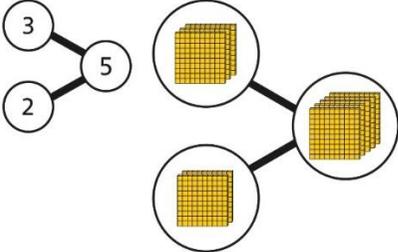
Multiplication and division: Children build a solid grounding in times-tables, understanding the multiplication and division facts in tandem. As such, they should be as confident knowing that 35 divided by 7 is 5 as knowing that 5 times 7 is 35. Children develop key skills to support multiplication methods: unitising, commutativity, and how to use partitioning effectively. Unitising allows children to use known facts to multiply and divide multiples of 10 and 100 efficiently. Commutativity gives children flexibility in applying known facts to calculations and problem solving. An understanding of partitioning allows children to extend their skills to multiplying and dividing 2- and 3-digit numbers by a single digit. Children develop column methods to support multiplications in these cases. For successful division, children will need to make choices about how to partition. For example, to divide 423 by 3, it is effective to partition 423 into 300, 120 and 3, as these can be divided by 3 using known facts. Children will also need to understand the concept of remainder, in terms of a given calculation and in terms of the context of the problem.

Fractions: Children develop the key concept of equivalent fractions, and link this with multiplying and dividing the numerators and denominators, as well as exploring the visual concept through fractions of shapes. Children learn how to find a fraction of an amount, and develop this with the aid of a bar model and other representations alongside. In Year 3, children develop an understanding of how to add and subtract fractions with the same denominator and find complements to the whole. This is developed alongside an understanding of fractions as numbers, including fractions greater than 1. In Year 4, children begin to work with fractions greater than 1. Decimals are introduced, as tenths in Year 3 and then as hundredths in Year 4. Children develop an understanding of decimals in terms of the relationship with fractions, with dividing by 10 and 100, and also with place value.

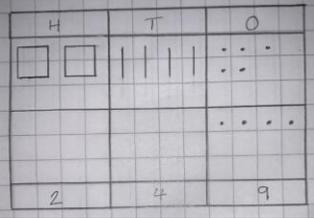
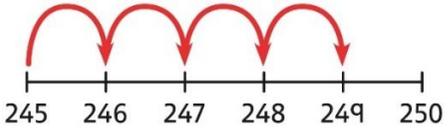
Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>Understanding 100s</p>	<p>Understand the cardinality of 100, and the link with 10 tens.</p> <p>Use cubes to place into groups of 10 tens.</p>	<p>Unitise 100 and count in steps of 100.</p>	<p>Represent steps of 100 on a number line and a number track and count up to 1,000 and back to 0.</p>
<p>Understanding place value to 1,000</p>	<p>Unitise 100s, 10s and 1s to build 3-digit numbers.</p>	<p>Use equipment to represent numbers to 1,000.</p> <p>Use a place value grid to support the structure of numbers to 1,000.</p> <p>Place value counters are used alongside other equipment. Children should understand how each counter represents a different unitised amount.</p>	<p>Represent the parts of numbers to 1,000 using a part-whole model.</p> <p>$215 = 200 + 10 + 5$</p> <p>Recognise numbers to 1,000 represented on a number line, including those between intervals.</p>

Year 3 – Addition

	Concrete	Pictorial	Abstract
Adding 100s	<p>Use known facts and unitising to add multiples of 100.</p>  <p>$3 + 2 = 5$ $3 \text{ hundreds} + 2 \text{ hundreds} = 5 \text{ hundreds}$ $300 + 200 = 500$</p>	<p>Use known facts and unitising to add multiples of 100.</p>  <p>$3 + 4 = 7$ $3 \text{ hundreds} + 4 \text{ hundreds} = 7 \text{ hundreds}$ $300 + 400 = 700$</p>	<p>Use known facts and unitising to add multiples of 100.</p> <p>Represent the addition on a number line.</p> <p>Use a part-whole model to support unitising.</p>  <p>$3 + 2 = 5$ $300 + 200 = 500$</p>

Year 3 – Addition

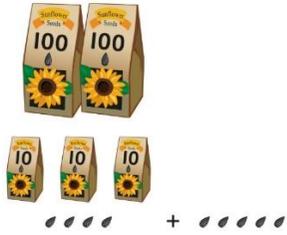
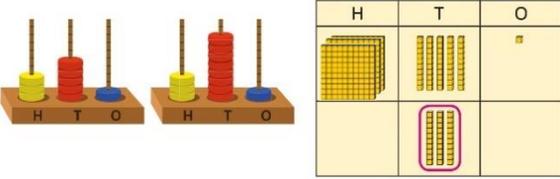
	Concrete	Pictorial	Abstract									
<p>3-digit number + 1s, no exchange or bridging</p>	<p>Use number bonds to add the 1s.</p>  <p>$214 + 4 = ?$</p> <p>Now there are 4 + 4 ones in total.</p> <p>$4 + 4 = 8$</p> <p>$214 + 4 = 218$</p>	<p>Use number bonds to add the 1s.</p> <table border="1" data-bbox="958 351 1261 595"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>4</td> <td>9</td> </tr> </tbody> </table> <p>Use number bonds to add the 1s. $5 + 4 = 9$</p>  <p>$245 + 4$ $5 + 4 = 9$</p> <p>$245 + 4 = 249$</p>	H	T	O				2	4	9	<p>Understand the link with counting on.</p> <p>$245 + 4$</p>  <p>Use number bonds to add the 1s and understand that this is more efficient and less prone to error.</p> <p>$245 + 4 = ?$</p> <p><i>I will add the 1s.</i> $5 + 4 = 9$ So, $245 + 4 = 249$</p>
H	T	O										
2	4	9										

Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>3-digit number + 1s with exchange</p>	<p>Understand that when the 1s sum to 10 or more, this requires an exchange of 10 ones for 1 ten.</p> <p>Children should explore this using unitised objects or physical apparatus.</p>	<p>Exchange 10 ones for 1 ten where needed. Use a place value grid to support the understanding.</p>	<p>Understand how to bridge by partitioning to the 1s to make the next 10.</p> <p> $135 + 7 = ?$ $135 + 5 + 2 = 142$ </p> <p>Ensure that children understand how to add 1s bridging a 100.</p> <p> $198 + 5 = ?$ $198 + 2 + 3 = 203$ </p>

$135 + 7 = 142$

Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>3-digit number + 10s, no exchange</p>	<p>Calculate mentally by forming the number bond for the 10s.</p>  <p> $234 + 50$ <i>There are 3 tens and 5 tens altogether.</i> $3 + 5 = 8$ <i>In total there are 8 tens.</i> $234 + 50 = 284$ </p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <p>$351 + 30 = ?$</p>  <p> $5 \text{ tens} + 3 \text{ tens} = 8 \text{ tens}$ $351 + 30 = 381$ </p>	<p>Calculate mentally by forming the number bond for the 10s.</p> <p>$753 + 40$</p> <p><i>I know that $5 + 4 = 9$</i></p> <p>So, $50 + 40 = 90$ $753 + 40 = 793$</p>

Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>3-digit number + 10s, with exchange</p>	<p>Understand the exchange of 10 tens for 1 hundred.</p>	<p>Add by exchanging 10 tens for 1 hundred.</p> <p>$184 + 20 = ?$</p> <p>$184 + 20 = 204$</p>	<p>Understand how the addition relates to counting on in 10s across 100.</p> <p>$184 + 20 = ?$</p> <p><i>I can count in 10s ... 194 ... 204</i></p> <p>$184 + 20 = 204$</p> <p>Use number bonds within 20 to support efficient mental calculations.</p> <p>$385 + 50$ <i>There are 8 tens and 5 tens. That is 13 tens.</i> $385 + 50 = 300 + 130 + 5$ $385 + 50 = 435$</p>
<p>3-digit number + 2-digit number</p>	<p>Use place value equipment to make and combine groups to model addition.</p>	<p>Use a place value grid to organise thinking and adding of 1s, then 10s.</p>	<p>Use the vertical column method to represent the addition. Children must understand how this relates to place value at each stage of the calculation.</p>

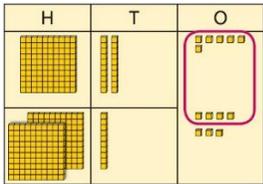
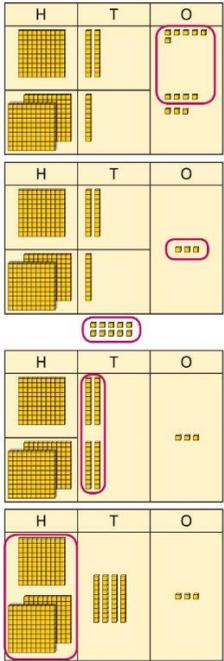
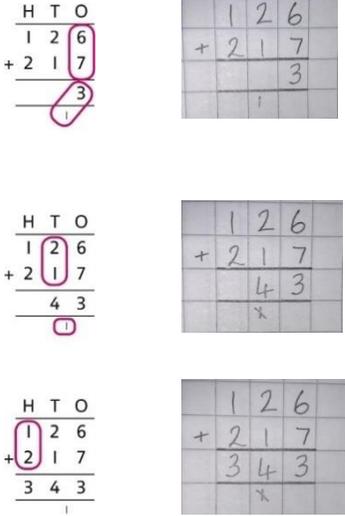
Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>3-digit number + 2-digit number, exchange required</p>	<p>Use place value equipment to model addition and understand where exchange is required.</p> <p><i>Use place value counters to represent $154 + 72$.</i></p> <p><i>Use this to decide if any exchange is required.</i></p> <p><i>There are 5 tens and 7 tens. That is 12 tens so 1 will exchange.</i></p>	<p>Represent the required exchange on a place value grid using equipment.</p> <p>$275 + 16 = ?$</p> <p>$275 + 16 = 291$</p> <p>Note: In this example, a mental method may be more efficient. The numbers for the example calculation have been chosen to allow children to visualise the concept and see how the method relates to place value. Children should be encouraged at every stage to select methods that are accurate and efficient.</p>	<p>Use a column method with exchange. Children must understand how the method relates to place value at each stage of the calculation.</p> <p>$275 + 16 = 291$</p>

Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>3-digit number + 3-digit number, no exchange</p>	<p>Use place value equipment to make a representation of a calculation. This may or may not be structured in a place value grid.</p> <p><i>326 + 541 is represented as:</i></p>	<p>Represent the place value grid with equipment to model the stages of column addition.</p>	<p>Use a column method to solve efficiently, using known bonds. Children must understand how this relates to place value at every stage of the calculation.</p>

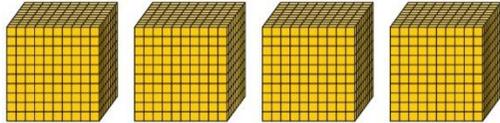
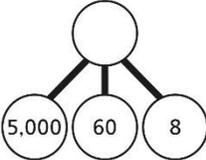
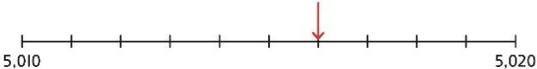
Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>3-digit number + 3-digit number, exchange required</p>	<p>Use place value equipment to enact the exchange required.</p>  <p><i>There are 13 ones. I will exchange 10 ones for 1 ten.</i></p>	<p>Model the stages of column addition using place value equipment on a place value grid.</p> 	<p>Use column addition, ensuring understanding of place value at every stage of the calculation.</p>  <p>$126 + 217 = 343$</p> <p>Note: Children should also study examples where exchange is required in more than one column, for example $185 + 318 = ?$</p>

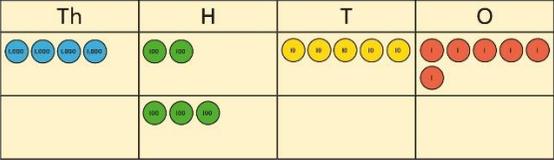
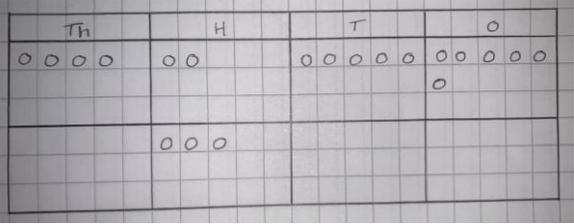
Year 3 – Addition

	Concrete	Pictorial	Abstract
<p>Representing addition problems, and selecting appropriate methods</p>	<p>Encourage children to use their own drawings and choices of place value equipment to represent problems with one or more steps.</p> <p>These representations will help them to select appropriate methods.</p>	<p>Children understand and create bar models to represent addition problems.</p> <p>$275 + 99 = ?$</p> <p>$275 + 99 = 374$</p>	<p>Use representations to support choices of appropriate methods.</p> <p><i>I will add 100, then subtract 1 to find the solution.</i></p> <p>$128 + 105 + 83 = ?$</p> <p><i>I need to add three numbers.</i></p> <p>$128 + 105 = 233$</p>

Year 4 – Addition

	Concrete	Pictorial	Abstract
<p>Understanding numbers to 10,000</p>	<p>Use place value equipment to understand the place value of 4-digit numbers.</p>  <p><i>4 thousands equal 4,000.</i></p> <p><i>1 thousand is 10 hundreds.</i></p>	<p>Represent numbers using place value counters once children understand the relationship between 1,000s and 100s.</p>  <p>$2,000 + 500 + 40 + 2 = 2,542$</p>	<p>Understand partitioning of 4-digit numbers, including numbers with digits of 0.</p>  <p>$5,000 + 60 + 8 = 5,068$</p> <p>Understand and read 4-digit numbers on a number line.</p> 

Year 4 – Addition

	Concrete	Pictorial	Abstract
Choosing mental methods where appropriate	Use unitising and known facts to support mental calculations. <i>Make 1,405 from place value equipment.</i> Add 2,000. Now add the 1,000s. 1 thousand + 2 thousands = 3 thousands $1,405 + 2,000 = 3,405$	Use unitising and known facts to support mental calculations.   <i>I can add the 100s mentally.</i> $200 + 300 = 500$ So, $4,256 + 300 = 4,556$	Use unitising and known facts to support mental calculations. $4,256 + 300 = ?$ $2 + 3 = 5$ $200 + 300 = 500$ $4,256 + 300 = 4,556$

Year 4 – Addition

	Concrete	Pictorial	Abstract																																																																																												
<p>Column addition with exchange</p>	<p>Use place value equipment on a place value grid to organise thinking.</p> <p>Ensure that children understand how the columns relate to place value and what to do if the numbers are not all 4-digit numbers.</p> <p><i>Use equipment to show 1,905 + 775.</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1000</td> <td>900 000 000 000</td> <td>00 00 00 00</td> <td>0 0 0 0 0 0</td> </tr> <tr> <td></td> <td>700 000 000 000</td> <td>70 00 00</td> <td>0 0 0 0 0 0</td> </tr> </tbody> </table> <p><i>Why have only three columns been used for the second row? Why is the Thousands box empty?</i></p> <p><i>Which columns will total 10 or more?</i></p>	Th	H	T	O	1000	900 000 000 000	00 00 00 00	0 0 0 0 0 0		700 000 000 000	70 00 00	0 0 0 0 0 0	<p>Use place value equipment to model required exchanges.</p> <p>Include examples that exchange in more than one column.</p>	<p>Use a column method to add, including exchanges.</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> <td>5</td> <td>4</td> </tr> <tr> <td>+ 4</td> <td>2</td> <td>3</td> <td>7</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td></td> <td></td> <td>9</td> <td>1</td> </tr> </tbody> </table> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> <td>5</td> <td>4</td> </tr> <tr> <td>+ 4</td> <td>2</td> <td>3</td> <td>7</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td></td> <td></td> <td>9</td> <td>1</td> </tr> </tbody> </table> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> <td>5</td> <td>4</td> </tr> <tr> <td>+ 4</td> <td>2</td> <td>3</td> <td>7</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td>7</td> <td>9</td> <td></td> <td>1</td> </tr> </tbody> </table> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> <td>5</td> <td>4</td> </tr> <tr> <td>+ 4</td> <td>2</td> <td>3</td> <td>7</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td>5</td> <td>7</td> <td>9</td> <td>1</td> </tr> </tbody> </table>	Th	H	T	O	1	5	5	4	+ 4	2	3	7	<hr/>						9	1	Th	H	T	O	1	5	5	4	+ 4	2	3	7	<hr/>						9	1	Th	H	T	O	1	5	5	4	+ 4	2	3	7	<hr/>				7	9		1	Th	H	T	O	1	5	5	4	+ 4	2	3	7	<hr/>				5	7	9	1
	Th	H	T	O																																																																																											
1000	900 000 000 000	00 00 00 00	0 0 0 0 0 0																																																																																												
	700 000 000 000	70 00 00	0 0 0 0 0 0																																																																																												
Th	H	T	O																																																																																												
1	5	5	4																																																																																												
+ 4	2	3	7																																																																																												
<hr/>																																																																																															
		9	1																																																																																												
Th	H	T	O																																																																																												
1	5	5	4																																																																																												
+ 4	2	3	7																																																																																												
<hr/>																																																																																															
		9	1																																																																																												
Th	H	T	O																																																																																												
1	5	5	4																																																																																												
+ 4	2	3	7																																																																																												
<hr/>																																																																																															
7	9		1																																																																																												
Th	H	T	O																																																																																												
1	5	5	4																																																																																												
+ 4	2	3	7																																																																																												
<hr/>																																																																																															
5	7	9	1																																																																																												

Year 4 – Addition

	Concrete	Pictorial	Abstract
			<p>Include examples that exchange in more than one column, e.g.</p>
Representing additions and checking strategies		<p>Bar models may be used to represent additions in problem contexts, and to justify mental methods where appropriate.</p> $ \begin{array}{r} \text{Th H T O} \\ 799 \\ + 574 \\ \hline 1373 \end{array} $ <p><i>I chose to work out $574 + 800$, then subtract 1.</i></p> <p><i>This is equivalent to $3,000 + 3,000$.</i></p>	<p>Use rounding and estimating on a number line to check the reasonableness of an addition.</p> <p>$912 + 6,149 = ?$</p> <p><i>I used rounding to work out that the answer should be approximately $1,000 + 6,000 = 7,000$.</i></p>

Year 5 – Addition

	Concrete	Pictorial	Abstract
<p>Column addition with whole numbers</p>	<p>Use place value equipment to represent additions.</p> <p>Add a row of counters onto the place value grid to show $15,735 + 4,012$.</p>	<p>Represent additions, using place value equipment on a place value grid alongside written methods.</p> <p><i>I need to exchange 10 tens for a 100.</i></p>	<p>Use column addition, including exchanges.</p> $ \begin{array}{r} \text{TTh Th H T O} \\ 15735 \\ + 4012 \\ \hline 19747 \\ \hline 37592 \end{array} $
			$ \begin{array}{r} \text{TTh Th H T O} \\ 20153 \\ + 19175 \\ \hline 39328 \end{array} $

Year 5 – Addition

	Concrete	Pictorial	Abstract																
Representing additions		<p>Bar models represent addition of two or more numbers in the context of problem solving.</p> <p>Jen: £2,600 Holly: £2,600 and £1,450</p> <p>£4,050</p> <table border="0"> <tr> <td>Th H T O</td> <td>Th H T O</td> </tr> <tr> <td>2 6 0 0</td> <td>2 6 0 0</td> </tr> <tr> <td>+ 1 4 5 0</td> <td>+ 4 0 5 0</td> </tr> <tr> <td><u>4 0 5 0</u></td> <td><u>6 6 5 0</u></td> </tr> </table>	Th H T O	Th H T O	2 6 0 0	2 6 0 0	+ 1 4 5 0	+ 4 0 5 0	<u>4 0 5 0</u>	<u>6 6 5 0</u>	<p>Use approximation to check whether answers are reasonable.</p> <table border="0"> <tr> <td>TTh Th H T O</td> <td>TTh Th H T O</td> </tr> <tr> <td>2 3 4 0 5</td> <td>2 3 4 0 5</td> </tr> <tr> <td>+ 7 8 9 2</td> <td>+ 7 8 9 2</td> </tr> <tr> <td><u>2 0 2 9 7</u></td> <td><u>3 1 2 9 7</u></td> </tr> </table> <p><i>I will use 23,000 + 8,000 to check.</i></p>	TTh Th H T O	TTh Th H T O	2 3 4 0 5	2 3 4 0 5	+ 7 8 9 2	+ 7 8 9 2	<u>2 0 2 9 7</u>	<u>3 1 2 9 7</u>
Th H T O	Th H T O																		
2 6 0 0	2 6 0 0																		
+ 1 4 5 0	+ 4 0 5 0																		
<u>4 0 5 0</u>	<u>6 6 5 0</u>																		
TTh Th H T O	TTh Th H T O																		
2 3 4 0 5	2 3 4 0 5																		
+ 7 8 9 2	+ 7 8 9 2																		
<u>2 0 2 9 7</u>	<u>3 1 2 9 7</u>																		
Adding tenths	<p>Link measure with addition of decimals.</p> <p><i>Two lengths of fencing are 0.6 m and 0.2 m. How long are they when added together?</i></p>	<p>Use a bar model with a number line to add tenths.</p> <p>$0.6 + 0.2 = 0.8$ <i>6 tenths + 2 tenths = 8 tenths</i></p>	<p>Understand the link with adding fractions.</p> $\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$ <p><i>6 tenths + 2 tenths = 8 tenths</i> $0.6 + 0.2 = 0.8$</p>																

Year 5 – Addition

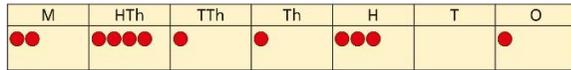
	Concrete	Pictorial	Abstract																											
Adding decimals using column addition	Use place value equipment to represent additions. Show $0.23 + 0.45$ using place value counters.	Use place value equipment on a place value grid to represent additions. Represent exchange where necessary.	Add using a column method, ensuring that children understand the link with place value.																											
		<div style="display: flex; align-items: flex-start;"> <table border="1" style="margin-right: 10px;"> <thead> <tr> <th>O</th> <th>.</th> <th>Tth</th> <th>Hth</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>20 20 20</td> <td>30 30</td> </tr> <tr> <td></td> <td></td> <td>40 40 40 40</td> <td>50 50</td> </tr> <tr> <td></td> <td></td> <td>20 20 20</td> <td>30 30</td> </tr> </tbody> </table> <div style="margin-right: 10px;"> $\begin{array}{r} 0 \cdot \text{Tth Hth} \\ 0 \cdot 23 \\ + 0 \cdot 45 \\ \hline 1 \cdot 25 \end{array}$ </div> </div> <p>Include examples where the numbers of decimal places are different.</p> <div style="display: flex; align-items: flex-start;"> <table border="1" style="margin-right: 10px;"> <thead> <tr> <th>O</th> <th>.</th> <th>Tth</th> <th>Hth</th> </tr> </thead> <tbody> <tr> <td>50 50 50 50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>10</td> <td></td> <td>20 20</td> <td>50 50 50 50</td> </tr> </tbody> </table> <div> $\begin{array}{r} 0 \cdot \text{Tth Hth} \\ 5 \cdot 00 \\ + 1 \cdot 25 \\ \hline 6 \cdot 25 \end{array}$ </div> </div>	O	.	Tth	Hth			20 20 20	30 30			40 40 40 40	50 50			20 20 20	30 30	O	.	Tth	Hth	50 50 50 50				10		20 20	50 50 50 50
O	.	Tth	Hth																											
		20 20 20	30 30																											
		40 40 40 40	50 50																											
		20 20 20	30 30																											
O	.	Tth	Hth																											
50 50 50 50																														
10		20 20	50 50 50 50																											

Year 6 – Addition

Comparing and selecting efficient methods

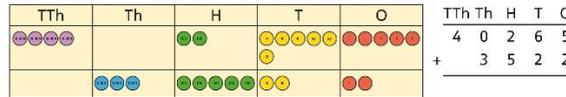
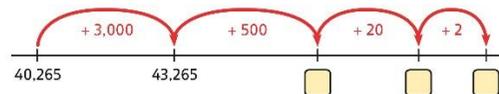
Concrete

Represent 7-digit numbers on a place value grid, and use this to support thinking and mental methods.

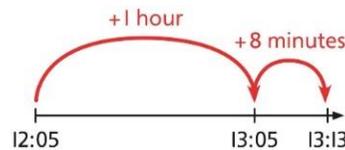


Pictorial

Discuss similarities and differences between methods, and choose efficient methods based on the specific calculation. Compare written and mental methods alongside place value representations.



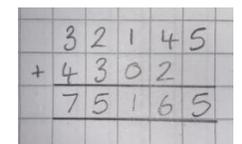
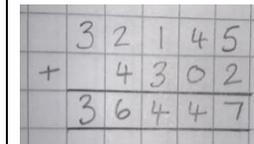
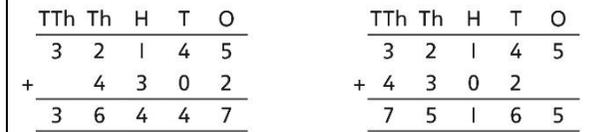
Use bar model and number line representations to model addition in problem-solving and measure contexts.



Abstract

Use column addition where mental methods are not efficient. Recognise common errors with column addition.

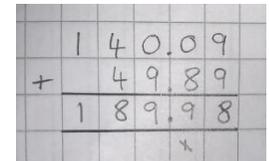
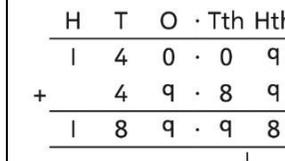
$32,145 + 4,302 = ?$



Which method has been completed accurately?

What mistake has been made?

Column methods are also used for decimal additions where mental methods are not efficient.



Year 6 – Addition

	Concrete	Pictorial	Abstract														
<p>Selecting mental methods for larger numbers where appropriate</p>	<p>Represent 7-digit numbers on a place value grid, and use this to support thinking and mental methods.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>M</td> <td>HTh</td> <td>TTh</td> <td>Th</td> <td>H</td> <td>T</td> <td>O</td> </tr> <tr> <td>●●</td> <td>●●●●</td> <td>●</td> <td>●</td> <td>●●●</td> <td></td> <td>●</td> </tr> </table> <p>$2,411,301 + 500,000 = ?$</p> <p><i>This would be 5 more counters in the HTh place.</i></p> <p><i>So, the total is 2,911,301.</i></p> <p>$2,411,301 + 500,000 = 2,911,301$</p>	M	HTh	TTh	Th	H	T	O	●●	●●●●	●	●	●●●		●	<p>Use a bar model to support thinking in addition problems.</p> <p>$257,000 + 99,000 = ?$</p> <p>The bar model shows a bar divided into two sections: £257,000 and £100,000. A bracket above the entire bar is labeled with a question mark. A vertical line is drawn at the end of the £100,000 section, extending upwards to the question mark.</p> <p><i>I added 100 thousands then subtracted 1 thousand.</i></p> <p>$257 \text{ thousands} + 100 \text{ thousands} = 357 \text{ thousands}$</p> <p>$257,000 + 100,000 = 357,000$ $357,000 - 1,000 = 356,000$</p> <p><i>So, $257,000 + 99,000 = 356,000$</i></p>	<p>Use place value and unitising to support mental calculations with larger numbers.</p> <p>$195,000 + 6,000 = ?$</p> <p>$195 + 5 + 1 = 201$</p> <p><i>195 thousands + 6 thousands = 201 thousands</i></p> <p><i>So, $195,000 + 6,000 = 201,000$</i></p>
M	HTh	TTh	Th	H	T	O											
●●	●●●●	●	●	●●●		●											

Year 6 – Addition

	Concrete	Pictorial	Abstract
Understanding order of operations in calculations	<p>Use equipment to model different interpretations of a calculation with more than one operation. Explore different results.</p> <p>$3 \times 5 - 2 = ?$</p> <p> $\begin{array}{r} 3 \times 5 - 2 \\ \downarrow \quad \downarrow \\ 3 \times 3 = 9 \end{array}$ </p> <p> $\begin{array}{r} 3 \times 5 - 2 \\ \downarrow \quad \downarrow \\ 15 - 2 = 13 \end{array}$ </p>	<p>Model calculations using a bar model to demonstrate the correct order of operations in multi-step calculations.</p> <p>This can be written as: $16 \times 4 + 16 \times 6$</p> $\begin{array}{r} 16 \times 4 + 16 \times 6 \\ 64 + 96 = 160 \end{array}$	<p>Understand the correct order of operations in calculations without brackets.</p> <p>Understand how brackets affect the order of operations in a calculation.</p> $4 + 6 \times 16$ $4 + 96 = 100$ $(4 + 6) \times 16$ $10 \times 16 = 160$