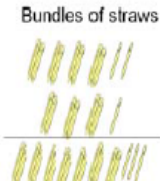
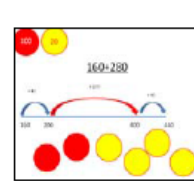
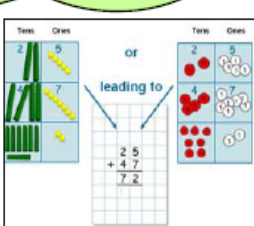
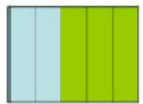


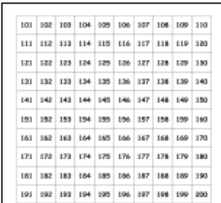
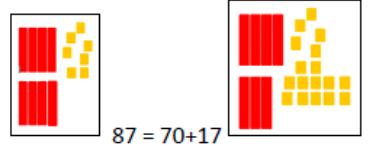
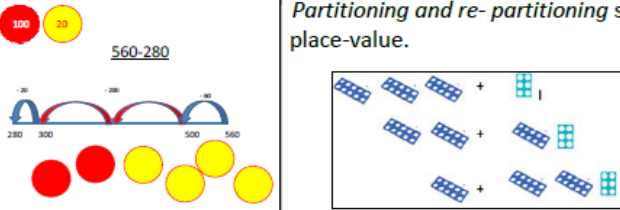




Rhodes Avenue Primary School Calculation Policy for addition Year 3

Mental Calculations	<p>Add numbers mentally, including:</p> <ul style="list-style-type: none"> • a three-digit number and ones • a three-digit number and tens • a three digit number and hundreds • Partition all numbers and recombine, start with TU + TU then HTU + TU • Use straws, dienes, place value counters, empty number lines 	<p>Common mental calculation strategies:</p> <p>Partitioning and recombining Doubles and near doubles Use number pairs to 10 and 100 Adding near multiples of ten and adjusting Using patterns of similar calculations Using known number facts Bridging though ten, hundred Complementary addition</p>						
Written Calculations	<p>Add numbers with up to three digits, using formal written (columnar) methods</p> <p>Add to three digit numbers using physical and abstract representations (e.g. straws, dienes, place value counters, empty number lines)</p> <ul style="list-style-type: none"> • raws, dienes, place value counters, empty number lines <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 30 + 4 \\ 20 + 5 \\ \hline 50 + 9 \end{array} \quad \begin{array}{r} 34 \\ +25 \\ \hline 59 \end{array}$ </div> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 200 + 30 + 4 \\ 500 + 20 + 7 \\ 700 + 60 + 1 \\ \hline 10 \quad 1 \end{array} \quad \begin{array}{r} 234 \\ + 527 \\ \hline 761 \end{array}$ </div> </div> <div style="background-color: orange; padding: 5px; text-align: center;"> Revert to concrete representations if children find expanded/column methods difficult </div>							
Representations to support mental and written calculations.	<p>Use a range of concrete, pictorial and abstract representations, including those below</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p>Bundles of straws</p>  <p>$42 + 31 = 73$</p> </div> <div style="width: 30%;"> <table style="border-collapse: collapse; text-align: left;"> <tr><td>$0 + 50 + 3$</td></tr> <tr><td>$10 + 40 + 3$</td></tr> <tr><td>$20 + 30 + 3$</td></tr> <tr><td>$30 + 20 + 3$</td></tr> <tr><td>$40 + 10 + 3$</td></tr> <tr><td>$50 + 0 + 3$</td></tr> </table> </div> <div style="width: 30%;">  <p>$160 + 280$</p> </div> </div> <div style="margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $\begin{array}{r} 76 + 21 \\ = 70 + 6 + 20 + 1 \\ = 90 + 7 = 97 \end{array}$ </div> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin-left: 20px; color: white; text-align: center;"> <p>What is the same and what is different about all these methods?</p> </div> </div> <div style="text-align: right; margin-top: 20px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; display: inline-block; background-color: #90EE90;"> <p>I can explain my method using representations</p> </div> <div style="margin-top: 10px;">  <p>Dienes and place value counters</p> </div> </div>	$0 + 50 + 3$	$10 + 40 + 3$	$20 + 30 + 3$	$30 + 20 + 3$	$40 + 10 + 3$	$50 + 0 + 3$	
$0 + 50 + 3$								
$10 + 40 + 3$								
$20 + 30 + 3$								
$30 + 20 + 3$								
$40 + 10 + 3$								
$50 + 0 + 3$								
Fractions	<p>Addition of fractions with the same denominator within one whole.</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p style="text-align: center;">Addition of fractions with the same denominator</p> <div style="display: flex; align-items: center;"> $\frac{2}{5} + \frac{3}{5} = \frac{5}{5}$ <div style="margin-left: 20px;">  </div> </div> </div>							
Links from other strands	<p>Pupils should estimate the answers to a calculation & use inverse operations to check answers.</p> <p>Add amounts of money using both £ and p in practical contexts.</p> <p>Measure, compare and add lengths (m/cm/mm), mass (kg/g) & volume/capacity (l/ml)</p>							



Rhodes Avenue Primary School Calculation Policy for subtraction Year 3

Mental Calculations	<p>Add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> *a three-digit number and ones *a three-digit number and tens *a three-digit number and hundreds. <p>Use a number line, dienes, hundred squares, two-hundred squares, and similar representations, to support mental calculations. (See Representations section below.)</p> 	<p><u>Use known number facts and place value to subtract</u> Continue as in Year 2 but with appropriate numbers e.g. $97 - 15 = 72$</p> <p>82 87 97</p> <p>-5 -10</p> <p>With practice, children will need to record less information and decide whether to count back or forward. It is useful to ask children whether counting up or back is the more efficient for calculations such as $57 - 12$, $86 - 77$ or $43 - 28$.</p> <p><u>Pencil and paper procedures</u> <u>Complementary addition</u> $84 - 56 = 28$</p> <p>+4 +20 +4</p> <p>56 60 80 84</p>
	<p>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.</p> <div data-bbox="373 853 636 1088"> <p>(1) Extended columnar - no exchange</p> <p><u>Extended method</u> $87 - 53 =$</p> <p>80 and 7 - 50 and 3 30 and 4 = 34</p> </div> <div data-bbox="655 869 989 1072"> <p>(2) Extended columnar - with exchange: $87 - 58$ becomes</p> $\begin{array}{r} 70 + 17 \\ - 50 + 8 \\ \hline 20 + 9 \end{array}$ </div> <div data-bbox="1032 869 1453 1048">  <p>$87 = 70 + 17$</p> </div>	
Representations to support mental and written calculations.	<p>Partitioning and re-partitioning support the understanding of place-value.</p>  <p>$30 + 6$ $20 + 16$ $10 + 26$</p> <p>All of these representations still comprise the amount of 36.</p> <p>Introduce transition from concrete place value representations, (e.g. dienes or straws), to pictorial – such as place value counters or money.</p>  <p>132 in dienes 132 in place value counters.</p>	<p>Revert to concrete manipulatives and expanded methods whenever difficulties arise</p>
	<p>Count up and down in tenths. Add and subtract fractions with the same denominator within one whole.</p> $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$	<p>Adding Fractions Bar model</p> 
Links from other strands	<p>Money and calculating duration of events (with number lines.)</p> <p>For example: "Add and subtract amounts of money to give change, using both £ and p in practical contexts."</p> <p>"Compare durations of events [for example to calculate the time taken by particular events or tasks]." (Measurement)</p>	



Rhodes Avenue Primary School Calculation Policy for multiplication Year 3

<p>Mental Calculations</p>	<ul style="list-style-type: none"> recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables (and 2, 5 and 10 multiplication tables from Y2) Use doubling to connect 2, 4 and 8 multiplication tables Develop efficient mental methods using commutativity and associativity Derive related multiplication and division facts calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods Partitioning: multiply the tens first and then multiply the units, e.g. $57 \times 6 = (50 \times 6) + (7 \times 6) = 300 + 42 = 342$ Children can apply these skills to solve spoken word problems too, Include missing number statements e.g. $72 \div \square = 8$ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The associative law: $4 \times 12 \times 5 = 4 \times 5 \times 12$ $= 20 \times 12$ $= 240$</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>The commutative law: $4 \times 12 = 12 \times 4$</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Ensure opportunities to learn multiplication tables through use of visual models, images and also rote learning.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Multiplication and division facts: $8 \times 4 = 32, 4 \times 8 = 32, 32 \div 4 = 8, 32 \div 8 = 4$</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Deriving related facts: $3 \times 2 = 60, 6 \div 3 = 2, 6 \div 2 = 3$ $\Rightarrow 30 \times 2 = 60, 60 \div 3 = 20, 20 \div 60 \div 3$</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>I have 8 packets, each containing 12 crayons. How many crayons do I have in total?</p> </div>																																																		
<p>Written Calculations</p>	<ul style="list-style-type: none"> write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, progressing to formal written methods Estimate before calculating Ensure written methods build on/relate to mental methods <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Towards the column method ...</p> <table style="border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">x</td><td style="border: 1px solid black; padding: 2px;">20</td><td style="border: 1px solid black; padding: 2px;">4</td></tr> <tr> <td style="border: 1px solid black; padding: 2px;">6</td><td style="border: 1px solid black; padding: 2px;">120</td><td style="border: 1px solid black; padding: 2px;">24</td></tr> </table> <p>$120 + 24 = 144$</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> $\begin{array}{r} 24 \\ \times 6 \\ \hline 120 \\ 24 \\ \hline 144 \end{array}$ </div> <div> 24×6 becomes $\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \end{array}$ </div> </div> <p>Answer: 144</p> </div>	x	20	4	6	120	24																																												
x	20	4																																																	
6	120	24																																																	
<p>Representations to support mental and written calculations.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>5×3</p> </div> <div style="text-align: center;"> <p>3×5</p> </div> <div style="text-align: center;"> <p>3 groups of 40</p> </div> </div> <div style="margin-top: 10px;"> <p>$19 \times 3 = 57$</p> <table style="border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">10</td><td style="border: 1px solid black; padding: 2px;">9</td></tr> <tr> <td style="border: 1px solid black; padding: 2px;">30</td><td style="border: 1px solid black; padding: 2px;">27</td></tr> <tr> <td colspan="2" style="border: 1px solid black; padding: 2px;">$= 57$</td></tr> </table> <p>Use arrays for partitioning too</p> </div> <div style="margin-top: 10px;"> <p>$13p \times 3$ $= 10p \times 3 + 3p \times 3$ $= 30p + 9p$ $= 39p$</p> </div> <div style="margin-top: 10px;"> <p>2 digit x 1 digit number: e.g. $7 \times 38 = 266$</p> <table style="border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">x</td><td style="border: 1px solid black; padding: 2px;">30</td><td style="border: 1px solid black; padding: 2px;">8</td></tr> <tr> <td style="border: 1px solid black; padding: 2px;">7</td><td style="border: 1px solid black; padding: 2px;">210</td><td style="border: 1px solid black; padding: 2px;">56</td></tr> </table> <p>$210 + 56 = 266$</p> </div> <div style="margin-top: 10px;"> </div>	10	9	30	27	$= 57$		x	30	8	7	210	56																																						
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<p>Fractions</p>	<ul style="list-style-type: none"> recognise and show, using diagrams, equivalent fractions with small denominators <div style="display: flex; align-items: center;"> <table style="border-collapse: collapse; text-align: center; font-size: 0.8em;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td></tr> <tr><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td></tr> <tr><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td></tr> <tr><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td></tr> </table> <div style="margin-left: 20px;"> </div> </div>	1	2	3	4	5	6	7	8	9	10	2	4	6	8	10	12	14	16	18	20	3	6	9	12	15	18	21	24	27	30	4	8	12	16	20	24	28	32	36	40	5	10	15	20	25	30	35	40	45	50
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5	10	15	20	25	30	35	40	45	50																																										
<p>Links from other strands</p>	<ul style="list-style-type: none"> solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. The comparison of measures includes simple scaling by integers (for example, a given quantity or measure is twice as long or five times as high) Pupils now use multiples of 2, 3, 4, 5, 8, 10, 50 and 100. Pupils understand and use simple scales (for example, 2, 5, 10 units per cm) in pictograms and bar charts with increasing accuracy. 																																																		



Rhodes Avenue Primary School Calculation Policy for division Year 3

Mental Calculations	<p>Pupils should be taught to recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.</p> <p><i>Pupils continue to practise their mental recall of multiplication tables... in order to improve fluency.</i></p> <p><i>Pupils develop efficient mental methods, for example, using commutativity and associativity (e.g., $4 \times 12 \times 5 = 4 \times 5 \times 12 = 20 \times 12 = 240$) and multiplication and division facts to derive related facts.</i></p> <p>$36 \div 3 = 12$</p> <p>$30 \div 3 = 10$ $6 \div 3 = 2$</p> <p>$30 + 6 = 36$</p>
Written Calculations	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects, (see Links from other strands, below.) <p>"I know $6 \div 3 = 2$, so $60 \div 3 = 20$." "I know $12 \div 3 = 4$, so $120 \div 3 = 40$."</p> <p>$120 \div 3$</p> <p>New written methods can be modelled alongside mental or informal methods to ensure understanding.</p>
Representations to support mental and written calculations.	<p>Use a range of concrete and pictorial resources, including:</p> <p>$98 \div 7 = 14$</p> <p>$63 \div 3 = 21$</p> <p>An image for $56 \div 7$</p> <p>How could I calculate $72 \div 3$?</p> <p>Informal exploration with manipulatives supports the progression to formal written methods—which is continued in Year 4.</p> <p>$72 \div 3 = 24$</p>
Fractions	<ul style="list-style-type: none"> • Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. • Recognise and show, using diagrams, equivalent fractions with small denominators. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
Links from other strands	<p>Pupils solve simple problems in contexts, including measuring and scaling contexts, (e.g., four times as high etc.) and correspondence problems.</p> <p>This is an enlarged copy of the front cover of a tiny book.</p> <p>This is the ground plan of a room.</p> <p>Scale: 1 mm on the plan means 10 cm in real life.</p> <p>a) In the plan, measure the</p> <ol style="list-style-type: none"> width of the room: length of the room: