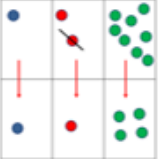
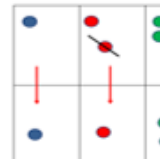
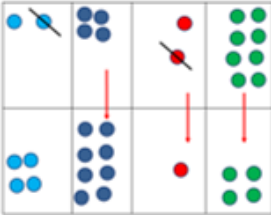
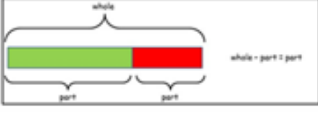
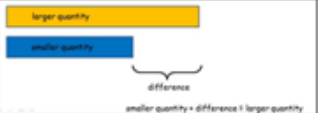


# Preston Primary School Adacemy – Calculation methods

## Subtraction

Obj	Gui	Year 4	Vid	Ex	Obj	Gui	Year 5	Vid	Ex	Obj	Gui	Year 6	Vid	Ex
		<p>Missing number/digit problems: <math>456 + \square = 710</math>; <math>107 + 6\square = 200</math>; <math>60 + 99 + \square = 340</math>; <math>200 - 90 - 80 = \square</math>; <math>225 - \square = 150</math>; <math>\square - 25 = 67</math>; <math>3450 - 1000 = \square</math>; <math>\square - 2000 = 900</math></p> <p><b>Mental methods</b> should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.</p> <ul style="list-style-type: none"> <li>Subtract numbers with up to 4 digits using columnar subtraction where appropriate.</li> </ul> <p><b>Written methods (progressing to 4-digits)</b> Expanded column subtraction with decomposition, modelled with place value counters, progressing to calculations with 4-digit numbers.</p>  $\begin{array}{r} 200 \phantom{00} \\ - 100 \phantom{00} \\ \hline 100 \phantom{00} \end{array}$ <p>If understanding of the expanded method is secure, children will move on to the formal method of decomposition, which again can be initially modelled with place value counters.</p>  $\begin{array}{r} 232 \\ - 114 \\ \hline 118 \end{array}$				<p>Missing number/digit problems: <math>6.45 = 6 + 0.4 + \square</math>; <math>119 - \square = 86</math>; <math>1\ 000\ 000 - \square = 999\ 000</math>; <math>600\ 000 + \square + 1000 = 671\ 000</math>; <math>12\ 462 - 2\ 300 = \square</math></p> <p><b>Mental methods</b> should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.</p> <ul style="list-style-type: none"> <li>Subtract whole numbers with more than 4 digits using columnar subtraction.</li> </ul> <p><b>Written methods (progressing to more than 4-digits)</b> When understanding of the expanded method is secure, children will move on to the formal method of decomposition, which can be initially modelled with place value counters.</p>  $\begin{array}{r} 6232 \\ - 4814 \\ \hline 1418 \end{array}$ <p>Progress to calculating with decimals, including those with different numbers of decimal places.</p>		<p>Missing number/digit problems: <math>\square</math> and <math>\#</math> each stand for a different number. <math>\# = 34</math>. <math>\# + \# = \square + \square + \#</math>. What is the value of <math>\square</math>? What if <math>\# = 28</math>? What if <math>\# = 21</math>?</p> <p><math>10\ 000\ 000 = 9\ 000\ 100 + \square</math> <math>7 - 2 \times 3 = \square</math>; <math>(7 - 2) \times 3 = \square</math>; <math>(\square - 2) \times 3 = 15</math></p> <p><b>Mental methods</b> should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.</p> <p><b>Written methods</b> As year 5, progressing to larger numbers, aiming for both conceptual understanding and procedural fluency with decomposition to be secured.</p> <p>Continue calculating with decimals, including those with different numbers of decimal places.</p>						

Year 4	Year 5	Year 6
<p>The Singapore Bar method.</p>  	<p>Continue with Singapore Bar Method.</p>	<p>Continue with the Singapore Bar Method.</p>

Subtraction		
Year 4	Year 5	Year 6
<p><b>Mental Strategies</b></p> <ul style="list-style-type: none"> <li>Children should continue to count back regularly, now including multiples of 6, 7, 9, 25 and 1000, and steps of 1/100.</li> <li>The number line should continue to be used as an important image to support thinking, and the use of informal jottings should be encouraged where appropriate.</li> <li>Children should continue to partition numbers in different ways.</li> </ul> <p>They should be encouraged to choose from a range of strategies:</p> <ul style="list-style-type: none"> <li>Counting forwards and backwards: <math>124 - 47</math>, count back 40 from 124, then 4 to 80, then 3 to 77</li> <li>Partitioning: counting back: <math>5.6 - 3.7</math>, <math>5.6 + 3.0 - 0.7 = 2.6 - 0.7</math></li> <li>Partitioning: bridging through multiples of 10: <math>6070 - 4987</math>, <math>4987 + 13 + 1000 + 70</math></li> <li>Partitioning: compensating: <math>138 - 69</math>, <math>138 - 70 + 1</math></li> <li>Partitioning: bridging through 60 to calculate a time interval – What was the time 47 minutes after 2.15pm?</li> <li>Using known facts and place value to find related facts e.g. <math>32 - 6 = 26</math>, <math>320 - 60 = 260</math>.</li> </ul> <p><b>Vocabulary</b> Sum, how much more? <u>ones</u> boundary, tens boundary, hundreds boundary, thousands boundary, tenths boundary, hundredths boundary, inverse, how many fewer? Equals sign, is the same as.</p> <p><b>Generalisations</b> Investigate when re-ordering works as a strategy for subtraction. Eg. <math>20 - 3 - 10 = 20 - 10 - 3</math>, but <math>3 - 20 - 10</math> would give a different answer.</p>	<p><b>Mental Strategies</b></p> <ul style="list-style-type: none"> <li>Children should continue to count regularly, on and back, now including steps of powers of 10.</li> <li>The number line should continue to be used as an important image to support thinking, and the use of informal jottings should be encouraged where appropriate.</li> <li>Children should continue to partition numbers in different ways.</li> </ul> <p>They should be encouraged to choose from a range of strategies:</p> <ul style="list-style-type: none"> <li>Counting backwards in tenths and hundredths: <math>1.7 - 0.55</math></li> <li>Reordering: <math>4.7 - 2.2 - 0.7</math>, <math>4.7 - 0.7 - 2.2</math></li> <li>Partitioning: counting back – <math>540 - 280</math>, <math>540 - 200 - 80</math></li> <li>Partitioning: bridging through multiples of 10:</li> <li>Partitioning: compensating: <math>5.7 - 3.9</math>, <math>5.7 - 4.0 + 0.1</math></li> <li>Partitioning: bridging through 60 to calculate a time interval: It is 11.45. How many hours and minutes is it to 15.20?</li> <li>Using known facts and place value to find related facts e.g. <math>32 - 6 = 26</math>, <math>3200 - 600 = 2600</math>.</li> </ul> <p><b>Vocabulary</b> tens of thousands boundary, Also see previous years</p> <p><b>Generalisation</b> Sometimes, always or never true? The difference between a number and its reverse will be a multiple of 9. What do you notice about the differences between consecutive square numbers? <u>Investigate <math>a - b = (a-1) - (b-1)</math> represented visually.</u></p> <p><b>Some Key Questions</b> What do you notice? What's the same? What's different? Can you convince me?</p>	<p><b>Mental Strategies</b></p> <ul style="list-style-type: none"> <li>Consolidate previous years.</li> <li>Children should experiment with order of operations, investigating the effect of positioning the brackets in different places, e.g. <math>20 - 5 \times 3 = 5</math>; <math>(20 - 5) \times 3 = 45</math></li> </ul> <p><b>Vocabulary</b> See previous years</p> <p><b>Generalisations</b> Order of operations: brackets first, then multiplication and division (left to right) before addition and subtraction (left to right). Children could learn an acronym such as PEMDAS, or could be encouraged to design their own ways of remembering. If you keep subtracting 3 from 397 you will eventually reach 0. Do you agree? Explain your reasoning.</p> <p><b>Some Key Questions</b> What do you notice? What's the same? What's different? Can you convince me? How do you know?</p>
<p><b>Some Key Questions</b> What do you notice? What's the same? What's different? Can you convince me? How do you know?</p>	<p>How do you know?</p>	

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