

## Calculation Policy Guidance

### Rationale

This policy outlines a model progression through written strategies for addition, subtraction, multiplication and division in line with the new National Curriculum commencing September 2014. Through the policy, we aim to link key manipulatives and representations in order that the children can be vertically accelerated through each strand of calculation. The policy ensures a consistent approach, enabling children to progress stage by stage through models and representations they recognise from previous teaching, allowing for deeper conceptual understanding and fluency. As children move at the pace appropriate to them, teachers will be presenting strategies and equipment appropriate to children's level of understanding. However, it is expected that the majority of children in each class will be working at age-appropriate levels as set out in the National Curriculum 2014.

### **The importance of mental mathematics**

While this policy focuses on written calculations in mathematics, we recognise the importance of the mental strategies and known facts that form the basis of all calculations. The following checklists outline the key skills and number facts that children are expected to develop throughout the school.

#### **To add and subtract successfully, children should be able to:**

- recall all addition pairs to  $9 + 9$  and number bonds to 10
- recognise addition and subtraction as inverse operations
- add mentally a series of one digit numbers (e.g.  $5 + 8 + 4$ )
- add and subtract multiples of 10 or 100 using the related addition fact and their knowledge of place value (e.g.  $600 + 700$ ,  $160 - 70$ )
- partition 2 and 3 digit numbers into multiples of 100, 10 and 1 in different ways  
(e.g. partition 74 into  $70 + 4$  or  $60 + 14$ )
- use estimation by rounding to check answers are reasonable

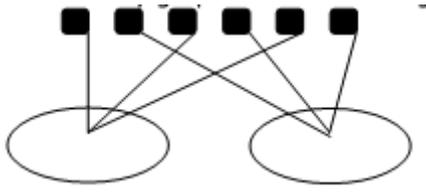
#### **To multiply and divide successfully, children should be able to:**

- add and subtract accurately and efficiently
- recall multiplication facts to  $12 \times 12 = 144$  and division facts to  $144 \div 12 = 12$
- use multiplication and division facts to estimate how many times one number divides into another etc.
- know the outcome of multiplying by 0 and by 1 and of dividing by 1
- understand the effect of multiplying and dividing whole numbers by 10, 100 and later 1000
- recognise factor pairs of numbers (e.g. that  $15 = 3 \times 5$ , or that  $40 = 10 \times 4$ ) and increasingly able to recognise common factors

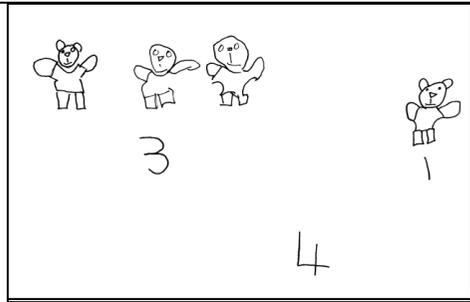
### **Calculation Policy Guidance**

- derive other results from multiplication and division facts and multiplication and division by 10 or 100 (and later 1000)
- notice and recall with increasing fluency inverse facts
- partition numbers into 100s, 10s and 1s or multiple groupings
- understand how the principles of commutative, associative and distributive laws apply or do not apply to multiplication and division
- understand the effects of scaling by whole numbers and decimal numbers or fractions
- understand correspondence where  $n$  objects are related to  $m$  objects
- investigate and learn rules for divisibility

**Calculation Policy Guidance**  
**FOUNDATION STAGE**

Addition	Subtraction	Multiplication	Division
<p>Pre-requisite skill:</p> <p>To be able to count reliably, including one to one correspondence:</p> <p>Before written calculations are introduced children will be given the opportunity to sing nursery rhymes and listen to stories that enable them to practise counting. They will practise counting and adding groups of objects practically.</p> <p>Adults will model and encourage use of mathematical language\9count on, altogether, one more Illustrate number stories with number sentences Model interpretation of add sign using appropriate language Deliberately count on the wrong number. Ask the children how to put it right.</p> <p>Teachers <i>demonstrate</i> the use of the numberline and children will use numberlines and practical resources to support calculation</p> <p><math>3 + 2 = 5</math></p>  <p>By the end of Foundation Stage all children will have developed ways of recording calculations using simple pictures such as</p>	<p>Pre – requisite skill:</p> <p>To be able to count forwards or backwards to 10.</p> <p>Before written calculations are introduces, children will be given lots of opportunities to sing nursery rhymes and take part in practical situations in order to re-inforce their understanding of the vocabulary – subtract, take away, less than, fewer than.</p> <p>Adults will model and encourage use of this mathematical language The children will have opportunities to Illustrate number stories with number sentences Model interpretation of – sign using appropriate language Comparing numbers of objects How many are left – count back How many have been removed – count on How many more are needed – count On</p> <p>Teachers demonstrate the use of the numberlines and children will use numberlines and practical resources to support calculation</p> <p><math>6 - 3 = 3</math></p>  <p>By the end of Foundation Stage all children will have developed ways of recording</p>	<p>Pre – requisite skills:</p> <p>To be confident in adding numbers.</p> <p>Before embarking on written multiplication, children will be given lots of opportunities for grouping objects and pattern work, both practical and oral.</p> <p>Solve practical problems in a real or role play context – e.g., how many shoe lace holes are there on this shoe? Put 5 cherries on each cake. How many cherries do you need?</p> <p>Oral counting in twos, fives and tens.</p> <p>Count repeated groups of the same si</p> <p>By the end of Foundation Stage all children will have developed ways of recording calculations using simple pictures such as</p>	<p>Pre- requisite skills:</p> <p>Children need to have early experiences of grouping or sharing in practical situations before they can embark on written division. Children will be given lots of opportunities to share objects and learn the associated vocab-ulary. For example, 'fair share,' 'divide,' 'how many left over.' Solve practical problems in a real or role play context – e.g., how many pairs of socks are there in the drawer? Can you cut the cake in half? How many pieces are there?</p> <p>Understand sharing as giving everyone the same amount – e.g., 6 grapes are shared equally between 2 people. How many grapes does each one get?</p>  <p>Share objects into equal groups and count how many in each group – e.g., ask three children to share 6 sweets – can you share these sweets between you?</p>

## Calculation Policy Guidance

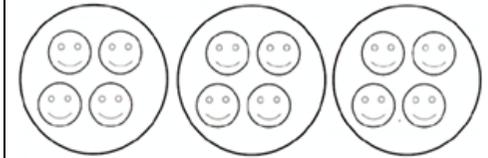
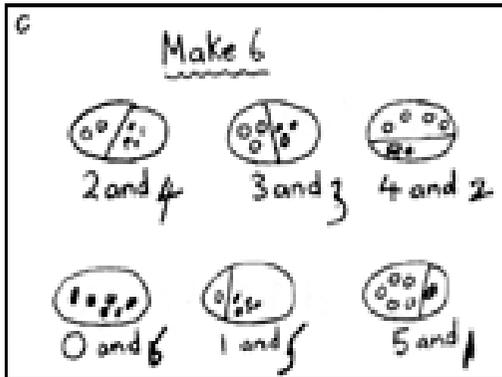


calculations using simple pictures such as



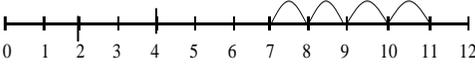
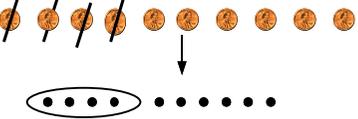
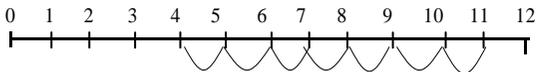
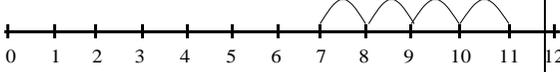
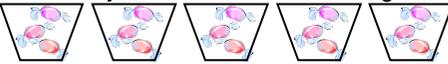
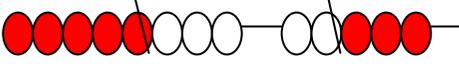
By the end of Foundation Stage all children will have developed ways of recording calculations using simple pictures such as

And  
**Observe number patterns in the environment - e.g., odd and even numbers on doors**  
**Sing nursery rhymes with number patterns**

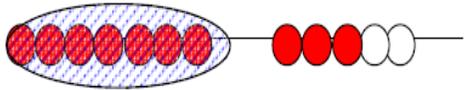


## Calculation Policy Guidance

### Year 1

Addition	Subtraction	Multiplication	Division
<p><b><u>+ = signs and missing numbers</u></b></p> <p> <math>3 + 4 = \square</math>      <math>\square = 3 + 4</math>  <math>3 + \square = 7</math>      <math>7 = \square + 4</math>  <math>\square + 4 = 7</math>      <math>7 = 3 + \square</math>  <math>\square + \nabla = 7</math>      <math>7 = \square + \nabla</math> </p> <p>Promoting covering up of operations and numbers.</p> <p><b><u>Number lines (numbered)</u></b></p> <p style="text-align: center;"><math>7 + 4</math></p>  <p>Recording by - drawing jumps on prepared lines</p> <p>constructing own lines</p> <p>(Teacher model number lines with missing numbers) alongside practical equipment. E.g. beads, numicon, counters etc</p> <p><i>(Teachers model jottings appropriate for larger numbers) using number lines and 100 squares,</i></p> <p style="text-align: center;"><b><u>Bridging through 10s</u></b></p> <p><i>This stage encourages children to become more efficient and begin to employ known facts.</i></p> <p><b><u>Bead string:</u></b></p>	<p><b><u>Pictures / marks</u></b></p> <p>Sam spent 4p. What was his change from 10p?</p>  <p><b><u>- = signs and missing numbers</u></b></p> <p> <math>7 - 3 = \square</math>      <math>\square = 7 - 3</math>  <math>7 - \square = 4</math>      <math>4 = \square - 3</math>  <math>\square - 3 = 4</math>      <math>4 = 7 - \square</math>  <math>\square - \nabla = 4</math>      <math>4 = \square - \nabla</math> </p> <p><b><u>Number lines (numbered)</u></b></p> <p style="text-align: center;"><math>11 - 7</math> (Counting back)</p>  <p>The difference between 7 and 11 (Counting up)</p>  <p>Recording by - drawing jumps on prepared lines - constructing own lines</p> <p>(Teachers model jottings appropriate for larger numbers) alongside practical equipment. E.g. beads, numicon, counters, 100 squares etc</p>	<p><b><u>Pictures and symbols</u></b></p> <p>There are 3 sweets in one bag. How many sweets are there in 5 bags?</p>  <p><i>(Recording on a number line modelled by the teacher when solving problems)</i></p> <p>Use of bead strings to model groups of.</p> 	<p><b><u>Pictures / marks</u></b></p> <p>12 children get into teams of 4 to play a game. How many teams are there?</p> 

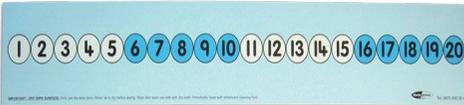
## Calculation Policy Guidance



$7 + 5$  is decomposed / partitioned into  $7 + 3 + 2$ .

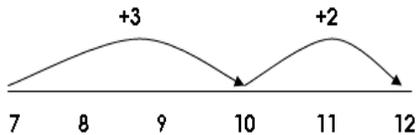
The bead string illustrates 'how many more to the next multiple of 10?' (children should identify how their number bonds are being applied) and then 'if we have used 3 of the 5 to get to 10, how many more do we need to add on?' (ability to decompose/partition all numbers applied)

Number track:



Steps can be recorded on a number track alongside the bead string, prior to transition to number line.

Number line



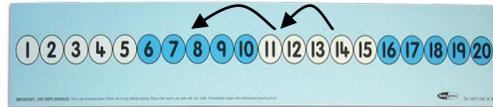
Bead string:



$12 - 7$  is decomposed / partitioned in  $12 - 2 - 5$ .

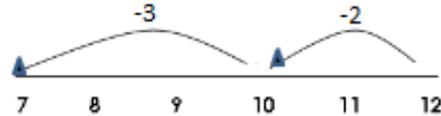
The bead string illustrates 'from 12 how many to the last/previous multiple of 10?' and then 'if we have used 2 of the 7 we need to subtract, how many more do we need to count back?' (ability to decompose/partition all numbers applied)

Number Track:



Steps can be recorded on a number track alongside the bead string, prior to transition to number line.

Number Line:



Counting up or 'Shop keepers' method

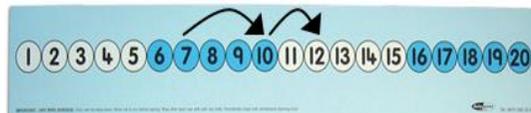
## Calculation Policy Guidance

Bead string:

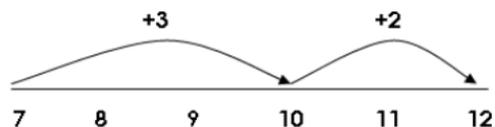


$12 - 7$  becomes  $7 + 3 + 2$ .  
Starting from 7 on the bead string 'how many more to the next multiple of 10?' (children should recognise how their number bonds are being applied), 'how many more to get to 12?'.

Number Track:

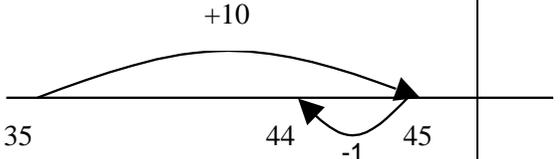
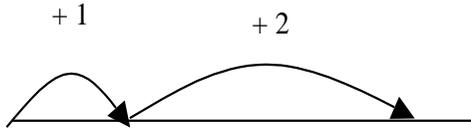
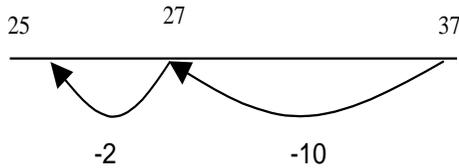
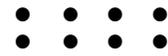
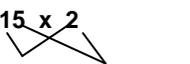
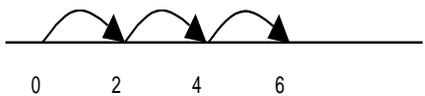


Number Line:



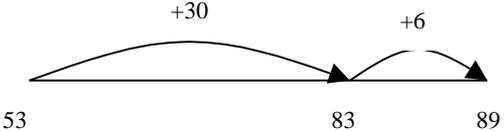
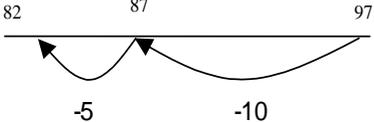
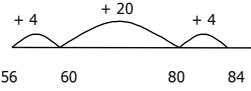
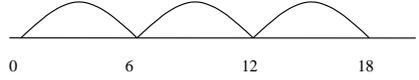
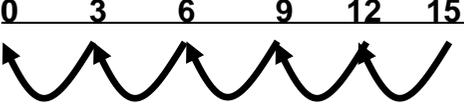
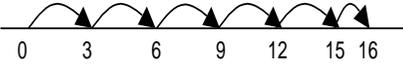
## Calculation Policy Guidance

### Year 2

Addition	Subtraction	Multiplication	Division
<p><b><u>+ = signs and missing numbers</u></b> Continue using a range of equations as in Year 1 but with appropriate, larger numbers. Extend to  <math>14 + 5 = 10 + \square</math>                      and adding three numbers  <math>32 + \square + \square = 100</math>   <math>35 = 1 + \square + 5</math></p> <p><b><u>Partition into tens and ones and recombine</u></b></p> $12 + 23 = 10 + 2 + 20 + 3$ $= 30 + 5$ $= 35$ <p><b>refine to partitioning the second number only:</b></p> $23 + 12 = 23 + 10 + 2$ $= 33 + 2$ $= 35$  <p>Add 9 or 11 by adding 10 and adjusting by 1  <math>35 + 9 = 44</math></p> 	<p><b><u>- = signs and missing numbers</u></b> Continue using a range of equations as in Year 1 but with appropriate numbers. Extend to <math>14 + 5 = 20 - \square</math></p> <p><b><u>Find a small difference by counting up</u></b></p> $42 - 39 = 3$  <p><math>35 - 9 = 26</math></p> <p><b><u>Use known number facts and place value to subtract</u></b> (partition second number only)  <math>37 - 12 = 37 - 10 - 2</math>  <math>= 27 - 2</math>  <math>= 25</math></p> 	<p><b><u>x = signs and missing numbers</u></b>  <math>7 \times 2 = \square</math>      <math>\square = 2 \times 7</math>  <math>7 \times \square = 14</math>      <math>14 = \square \times 7</math>  <math>\square \times 2 = 14</math>      <math>14 = 2 \times \square</math>  <math>\square \times \nabla = 14</math>      <math>14 = \square \times \nabla</math></p> <p><b><u>Arrays and repeated addition</u></b></p>  <p>or repeated addition  <math>2 + 2 + 2 + 2</math></p>  <p><b><u>Doubling multiples of 5 up to 50</u></b></p> $15 \times 2 = 30$ <p><b>Partition</b></p>  $20 + 10 = 30$	<p><b><u>÷ = signs and missing numbers</u></b></p> $6 \div 2 = \square$ $\square = 6 \div 2$ $6 \div \square = 3$ $3 = 6 \div \square$ $\square \div 2 = 3$ $3 = \square \div 2$ $\square \div \nabla = 3$ $3 = \square \div \nabla$ <p><b><u>Understand division as sharing and grouping</u></b></p> <p>Sharing – 6 sweets are shared between 2 people. How many do they have each?</p>  <p><math>6 \div 2</math> can be modelled as:</p> <p>Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?) Alongside practical equipment and use of arrays.</p> 

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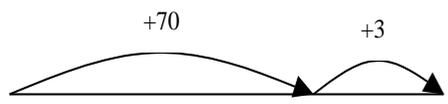
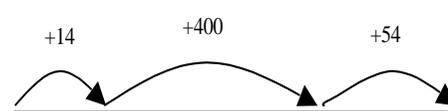
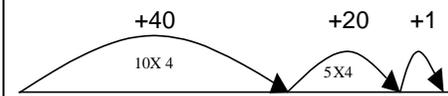
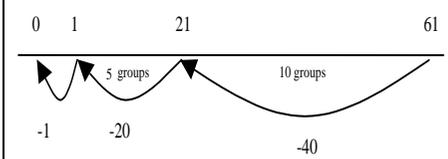
### Year 3

Addition	Subtraction	Multiplication	Division															
<p><b><u>+ = signs and missing numbers</u></b> Continue using a range of equations as in Year 1 and 2 but with appropriate, larger numbers.</p> <p><b><u>Partition into tens and ones and recombine</u></b> Partition both numbers and recombine. Refine to partitioning the second number only e.g.  <math>36 + 53 = 53 + 30 + 6</math>  <math>= 83 + 6</math>  <math>= 89</math></p>  <p><b><u>Add a near multiple of 10 to a two-digit number</u></b> Continue as in Year 2 but with appropriate numbers e.g. <math>35 + 19</math> is the same as <math>35 + 20 - 1</math>.</p> <p><b><u>pencil and paper procedures</u></b> <math>83 + 42 = 125</math></p> <table style="margin-left: 20px;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px;"> <math display="block">\begin{array}{r} 80 + 3 \\ +40 + 2 \\ \hline 120 + 5 = 125 \end{array}</math> </td> <td style="padding: 0 10px; border-right: 1px solid black; text-align: center;"> <p style="margin: 0;"><b><u>More able</u></b></p> </td> <td> <math display="block">\begin{array}{r} 83 \\ + 42 \\ \hline 120 \\ \phantom{120} + 5 \\ \hline 125 \end{array}</math> </td> </tr> </table>	$\begin{array}{r} 80 + 3 \\ +40 + 2 \\ \hline 120 + 5 = 125 \end{array}$	<p style="margin: 0;"><b><u>More able</u></b></p>	$\begin{array}{r} 83 \\ + 42 \\ \hline 120 \\ \phantom{120} + 5 \\ \hline 125 \end{array}$	<p><b><u>- = signs and missing numbers</u></b> <b>Continue using a range of equations as in Year and 2 but with appropriate numbers.</b> Find a small difference by counting up <b>Continue as in Year 2 but with appropriate numbers e.g. <math>102 - 97 = 5</math></b> Subtract mentally a 'near multiple of 10' to or from a two-digit number <b>Continue as in Year 2 but with appropriate numbers e.g. <math>78 - 49</math> is the same as <math>78 - 50 + 1</math></b> <u>Use known number facts and place value to subtract</u> Continue as in Year 2 but with appropriate numbers e.g. <math>97 - 15 = 72</math></p>  <p><b><u>Pencil and paper procedures</u></b> Complementary addition <math>84 - 56 = 28</math></p> 	<p><b><u>x = signs and missing numbers</u></b> Continue using a range of equations as in Year 2 but with appropriate numbers.</p> <p>Number lines <math>6 \times 3</math></p>  <p>Arrays and repeated addition Continue to understand multiplication as repeated addition and continue to use arrays (as in Year 2).</p> <p>Doubling multiples of 5 up to 50 <math>35 \times 2 = 70</math></p> <p>Partition</p> <table style="margin-left: 20px;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">x</td> <td style="border-right: 1px solid black; padding: 0 5px;">30</td> <td style="padding: 0 5px;">5</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">2</td> <td style="border-right: 1px solid black; padding: 0 5px;">60</td> <td style="padding: 0 5px;">10</td> </tr> </table> <p>Use known facts and place value to carry out simple multiplications</p> <p>Use the same method as above (partitioning), e.g. <math>32 \times 3 = 96</math></p> <table style="margin-left: 20px;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">x</td> <td style="border-right: 1px solid black; padding: 0 5px;">30</td> <td style="padding: 0 5px;">2</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px;">3</td> <td style="border-right: 1px solid black; padding: 0 5px;">90</td> <td style="padding: 0 5px;">6</td> </tr> </table>	x	30	5	2	60	10	x	30	2	3	90	6	<p><b><u>÷ = signs and missing numbers</u></b> Continue using a range of equations as in Year 2 but with appropriate numbers.</p> <p><b><u>Understand division as sharing and grouping</u></b> <math>15 \div 3</math> can be modelled as: Sharing – 15 shared between 3 (see Year 2 diagram) <b>OR</b></p>  <p>Or <math>18 \div 3</math> can be modelled as: Sharing – 18 shared between 3 (see Year 2 diagram)</p> <p>Grouping - How many 3's make 18?</p>  <p><b>Remainders</b> <math>16 \div 3 = 5 \text{ r}1</math> Sharing - 16 shared between 3, how many left over? Grouping – How many 3's make 16, how many left over? e.g.</p> 
$\begin{array}{r} 80 + 3 \\ +40 + 2 \\ \hline 120 + 5 = 125 \end{array}$	<p style="margin: 0;"><b><u>More able</u></b></p>	$\begin{array}{r} 83 \\ + 42 \\ \hline 120 \\ \phantom{120} + 5 \\ \hline 125 \end{array}$																
x	30	5																
2	60	10																
x	30	2																
3	90	6																



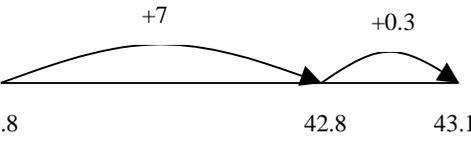
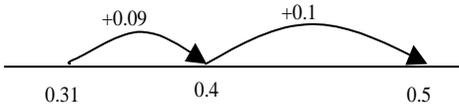
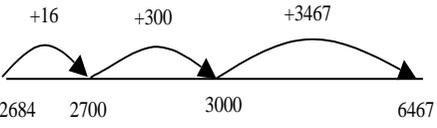
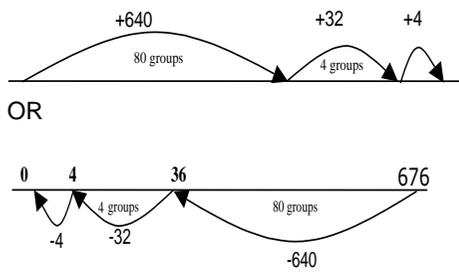
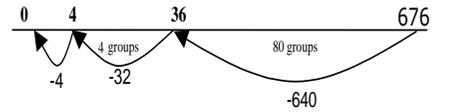
## Calculation Policy Guidance

### Year 5

Addition	Subtraction	Multiplication	Division									
<p><b><u>+ = signs and missing numbers</u></b> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><b><u>Partition into hundreds, tens and ones and recombine</u></b> Either partition both numbers and recombine or partition the second number only e.g.  <math>358 + 73 = 358 + 70 + 3</math>  <math>= 428 + 3</math>  <math>= 431</math></p>  <p style="text-align: center;">358                      428              431</p> <p><b><u>Add or subtract the nearest multiple of 10 or 100, then adjust</u></b> Continue as in Year 2, 3 and 4 but with appropriate numbers e.g. <math>458 + 79 =</math> is the same as <math>458 + 80 - 1</math></p> <p><b><u>Pencil and paper procedures</u></b></p> $\begin{array}{r} 56 \\ +37 \\ 13 \\ \hline 80 \\ \hline 93 \end{array}$ <p><b>Leading to formal method, showing numbers carried.</b></p> $\begin{array}{r} 358 \\ + 73 \\ \hline 431 \\ \hline \end{array}$ <p>Extend to numbers with at least four digits  <math>3587 + 675 = 4262</math></p> $\begin{array}{r} 3587 \\ + 675 \\ \hline 4262 \\ \hline \end{array}$ <p>Revert to expanded methods if the children experience any difficulty. Extend to decimals (same number of decimal places) and adding several numbers (with different numbers of digits, including decimals ). <b>Model negative numbers using a number line.</b></p>	<p><b><u>- = signs and missing numbers</u></b> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p>Find a difference by counting up e.g. <math>8006 - 2993 = 5013</math> This can be modelled on an empty number line (see complementary addition below).</p> <p><b><u>Subtract the nearest multiple of 10 or 100, then adjust.</u></b> Continue as in Year 2, 3 and 4 but with appropriate numbers.</p> <p><b><u>Use known number facts and place value to subtract</u></b></p> <p><b>Pencil and paper procedures</b> Complementary addition  <math>754 - 286 = 468</math></p>  <p style="text-align: center;">286      300                      700              754</p> <p>72-39</p> $\begin{array}{r} 60 \quad 12 \\ 372 \Rightarrow 300 \&70 \&-2 \\ -139 \quad -100 \&30 \&9 \\ \hline 33 \quad \leftarrow 200 \&30 \&3 \end{array}$	<p><b><u>x = signs and missing numbers</u></b> Continue using a range of equations as in Year 2 but with appropriate numbers</p> <p><b><u>Partition</u></b>  <math>47 \times 6 = 92</math></p> $47 \times 6 = (40 \times 6) + (7 \times 6)$ $= (240) + (42)$ $= 282$ <p><b>OR</b></p> <p>Use the grid method of multiplication (as below)</p> <p><b><u>Pencil and paper procedures</u></b> Grid method  <math>72 \times 38</math> is approximately <math>70 \times 40 = 2800</math></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">70</td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;">30</td> <td style="padding: 5px;">2100</td> <td style="padding: 5px;">60</td> </tr> <tr> <td style="padding: 5px;">8</td> <td style="padding: 5px;">560</td> <td style="padding: 5px;">16</td> </tr> </table> <p>Extend to simple decimals with one decimal place.</p> $\begin{array}{r} 12.5 \\ \times 2 \\ \hline 1.0 \quad (2.0 \times 0.5) \\ 4.0 \quad (2.0 \times 2.0) \\ \hline 20.0 \quad (2.0 \times 10.0) \\ 25.0 \end{array}$ <p><b>Moving to formal methods of multiplication for decimals. Carrying numbers underneath.</b></p>	x	70	2	30	2100	60	8	560	16	<p><b><u>÷ = signs and missing numbers</u></b> Continue using a range of equations as in Year 2 but with appropriate numbers.</p> <p><b><u>Sharing and grouping</u></b> Continue to understand division as both sharing and grouping (repeated subtraction).</p> <p><b>Remainders</b> Quotients expressed as fractions or decimal fractions  <math>61 \div 4 = 15 \frac{1}{4}</math> or 15.25</p>  <p><b>OR</b></p>  <p><b><u>Pencil and paper procedures</u></b>  <math>256 \div 7</math> lies between <math>210 \div 7 = 30</math> and <math>280 \div 7 = 40</math></p> $\begin{array}{r} 256 \\ - 70 \quad (10 \text{ groups}) \quad \text{or } (10 \times 7) \\ \hline 186 \\ - 140 \quad (20 \text{ groups}) \quad \text{or } (20 \times 7) \\ \hline 46 \\ - 42 \quad (6 \text{ groups}) \quad \text{or } (6 \times 7) \\ \hline 4 \quad (36 \text{ groups}) \quad \text{or } (36) \end{array}$ <p><b>Answer:</b> 36 remainder 4</p>
x	70	2										
30	2100	60										
8	560	16										

## Calculation Policy Guidance

### Year 6

Addition	Subtraction	Multiplication	Division																																		
<p><b>+ = signs and missing numbers</b> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><b>Partition into hundreds, tens, ones and decimal fractions and recombine</b> Either partition both numbers and recombine or partition the second number only e.g.  <math>35.8 + 7.3 = 35.8 + 7 + 0.3</math>  <math>= 42.8 + 0.3</math>  <math>= 43.1</math></p>  <p><math>35.8 \qquad\qquad\qquad 42.8 \qquad\qquad\qquad 43.1</math></p> <p><b>Add the nearest multiple of 10, 100 or 1000, then adjust</b> Continue as in Year 2, 3, 4 and 5 but with appropriate numbers including extending to adding 0.9, 1.9, 2.9 etc</p> <p><b>Pencil and paper procedures</b> Extend to numbers with any number of digits and decimals with 1 and 2 decimal places.  <math>124.9 + 117.25 = 242.15</math></p> $\begin{array}{r} 124.9 \\ + 117.25 \\ \hline 242.15 \end{array}$ <p>Revert to expanded methods if the children experience any difficulty. Extend to decimals (either one or two decimal places).</p>	<p><b>- = signs and missing numbers</b> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers. Find a difference by counting up e.g. <math>0.5 - 0.31 = 0.19</math> This can be modelled on an empty number line (see complementary addition below).</p>  <p><math>0.31 \qquad\qquad\qquad 0.4 \qquad\qquad\qquad 0.5</math></p> <p><b>Subtract the nearest multiple of 10, 100 or 1000, then adjust</b> Continue as in Year 2, 3, 4 and 5 but with appropriate numbers. Use known number facts and place value to subtract Continue as year 5</p> <p><b>Pencil and paper procedures</b> Complementary addition  <math>6467 - 2684 = 3783</math></p>  <p><math>2684 \qquad 2700 \qquad\qquad\qquad 3000 \qquad\qquad\qquad 6467</math></p> $\begin{array}{r} 3783 \\ \phantom{0}60 \phantom{0}12 \\ 372 \Rightarrow 300 \ \&70 \ \& \ -2 \\ -139 \quad -100 \ \& \ 30 \ \& \ 9 \\ \hline 33 \leftarrow 200 \ \& \ 30 \ \& \ 3 \end{array}$ <p>Leading to:</p> $\begin{array}{r} 61 \\ 372 \\ -139 \\ \hline 233 \end{array}$	<p><b>x = signs and missing numbers</b> Continue using a range of equations as in Year 2 but with appropriate numbers</p> <p><b>Partition</b>  <math>87 \times 6 = 522</math>  <math>87 \times 6 = (80 \times 6) + (7 \times 6)</math>  <math>= (480) + (42)</math>  <math>= 522</math></p> <p>OR</p> $\begin{array}{r} 87 \\ \times 6 \\ \hline 42 \quad (6 \times 7) \\ 480 \quad (6 \times 80) \\ \hline 522 \quad (\text{units, then tens, hundreds etc}) \end{array}$ <p>OR</p> <p>Use the grid method of multiplication (as below)</p> <p><b>Pencil and paper procedures</b> <b>Grid method</b>  <math>372 \times 24</math> is approximately <math>400 \times 20 = 8000</math></p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px;"><math>x</math></td> <td style="border-right: 1px solid black; padding: 5px;">300</td> <td style="border-right: 1px solid black; padding: 5px;">70</td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">20</td> <td style="border-right: 1px solid black; padding: 5px;">6000</td> <td style="border-right: 1px solid black; padding: 5px;">1400</td> <td style="padding: 5px;">40</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">4</td> <td style="border-right: 1px solid black; padding: 5px;">1200</td> <td style="border-right: 1px solid black; padding: 5px;">280</td> <td style="padding: 5px;">8</td> </tr> </table> <p>Extend to decimals with up to two decimal places.  <math>12.5 \times 2.5</math>  <math>1.25 \quad (2.5 \times 0.5)</math>  <math>5.0 \quad (2.5 \times 2.0)</math>  <math>25.0 \quad (2.5 \times 10.0)</math>  <math>31.25</math></p> <p>Moving to formal methods of multiplication for decimals. Carrying numbers underneath.</p>	$x$	300	70	2	20	6000	1400	40	4	1200	280	8	<p><b>÷ = signs and missing numbers</b> Continue using a range of equations as in Year 2 but with appropriate numbers.</p> <p><b>Sharing and grouping</b> Continue to understand division as both sharing and grouping (repeated subtraction).</p> <p><b>Remainders</b> Quotients expressed as fractions or decimal fractions  <math>676 \div 8 = 84.5</math></p>  <p>OR</p>  <p><b>Pencil and paper procedures</b>  <math>977 \div 36</math> is approximately <math>1000 \div 40 = 25</math></p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><math>977</math></td> <td style="padding: 5px;"><math>977</math></td> </tr> <tr> <td style="padding: 5px;"><math>- \underline{360} \quad (10 \text{ groups})</math></td> <td style="padding: 5px;"><math>- \underline{720}</math></td> </tr> <tr> <td style="padding: 5px;"><math>\quad (20 \text{ groups})</math></td> <td style="padding: 5px;"><math>\quad 257</math></td> </tr> <tr> <td style="padding: 5px;"><math>- \underline{360} \quad (10 \text{ groups})</math></td> <td style="padding: 5px;"><math>- \underline{180}</math></td> </tr> <tr> <td style="padding: 5px;"><math>\quad (5 \text{ groups})</math></td> <td style="padding: 5px;"><math>\quad 77</math></td> </tr> <tr> <td style="padding: 5px;"><math>\quad 257</math></td> <td style="padding: 5px;"><math>\quad \text{to} \quad 77</math></td> </tr> <tr> <td style="padding: 5px;"><math>- \underline{180} \quad (5 \text{ groups})</math></td> <td style="padding: 5px;"><math>- \underline{72}</math></td> </tr> <tr> <td style="padding: 5px;"><math>\quad (2 \text{ groups})</math></td> <td style="padding: 5px;"><math>\quad 5</math></td> </tr> <tr> <td style="padding: 5px;"><math>\quad 77</math></td> <td style="padding: 5px;"><math>\quad 5</math></td> </tr> <tr> <td style="padding: 5px;"><math>- \underline{72} \quad (2 \text{ groups})</math></td> <td style="padding: 5px;"><math>\quad 5</math></td> </tr> <tr> <td style="padding: 5px;"><math>\quad 5</math></td> <td style="padding: 5px;"><math>\quad 5</math></td> </tr> </table> <p>Answer: <math>27 \frac{5}{36}</math></p> <p><b>Short division to be taught if secure with methods above</b></p>	$977$	$977$	$- \underline{360} \quad (10 \text{ groups})$	$- \underline{720}$	$\quad (20 \text{ groups})$	$\quad 257$	$- \underline{360} \quad (10 \text{ groups})$	$- \underline{180}$	$\quad (5 \text{ groups})$	$\quad 77$	$\quad 257$	$\quad \text{to} \quad 77$	$- \underline{180} \quad (5 \text{ groups})$	$- \underline{72}$	$\quad (2 \text{ groups})$	$\quad 5$	$\quad 77$	$\quad 5$	$- \underline{72} \quad (2 \text{ groups})$	$\quad 5$	$\quad 5$	$\quad 5$
$x$	300	70	2																																		
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**Calculation Policy Guidance**

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