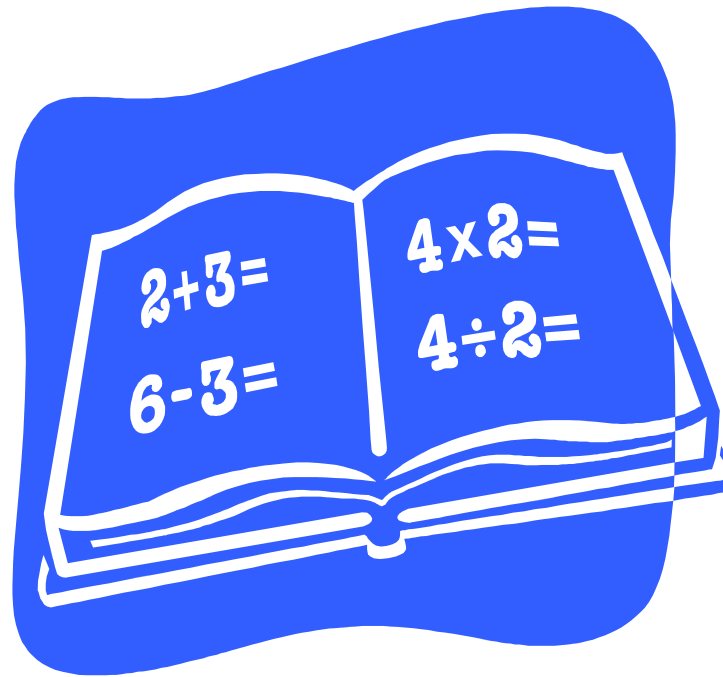
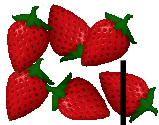
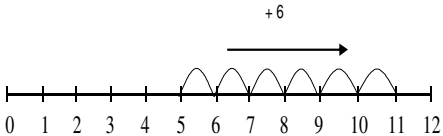
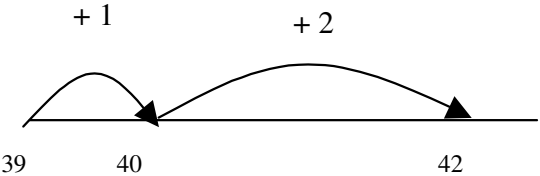
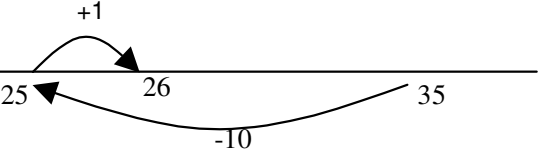
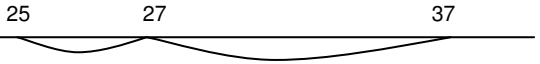
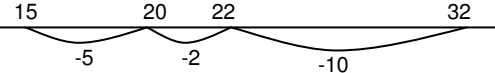
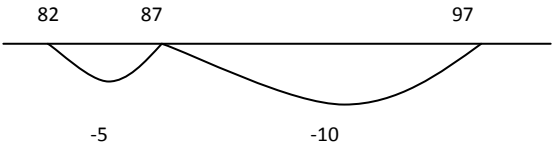
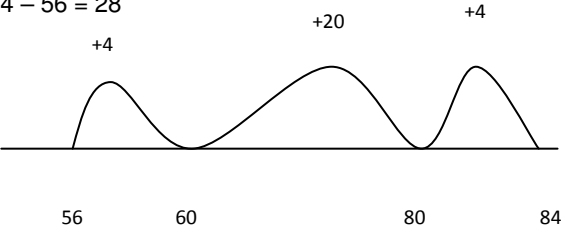
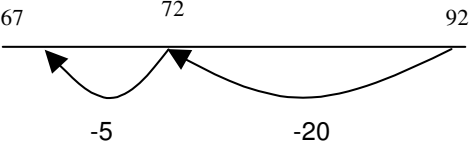
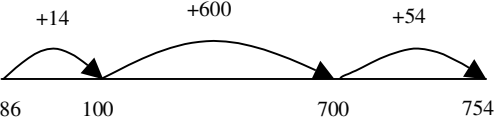
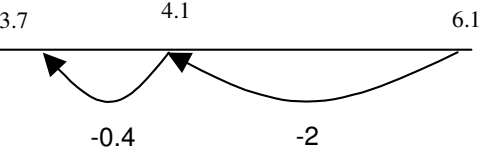
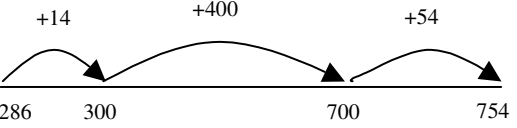
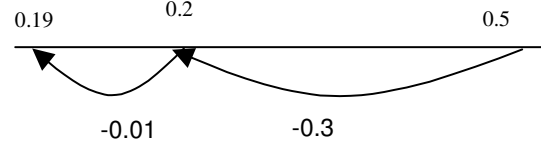
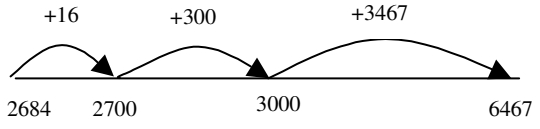


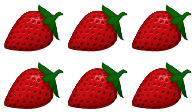
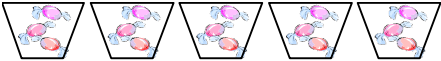
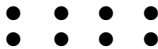

Calculations Policy / Pathway



Year 4	Year 5	Year 6																												
<p><u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Partition into tens and ones and recombine</u> Either partition both numbers and recombine or partition the second number only e.g. $55 + 37 = 55 + 30 + 7$ $= 85 + 7$ $= 92$</p> <p><u>Add the nearest multiple of 10, then adjust</u></p> <p>Continue as in Year 2 and 3 but with appropriate numbers e.g. $63 + 29$ is the same as $63 + 30 - 1$</p> <p><u>Pencil and paper procedures</u> $367 + 185 = 431$ either or</p> <table style="display: inline-table; vertical-align: middle;"> <tr><td style="text-align: right;">367</td><td style="padding-left: 20px;">300 + 60 + 7</td></tr> <tr><td style="text-align: right;">+185</td><td style="padding-left: 20px;">100 + 80 + 5</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">12</td><td style="padding-left: 20px;">400 + 140 + 12 = 552</td></tr> <tr><td style="text-align: right;">140</td><td></td></tr> <tr><td style="text-align: right;">400</td><td></td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">552</td><td></td></tr> </table> <p>leading to</p> <table style="display: inline-table; vertical-align: middle;"> <tr><td style="text-align: right;">367</td></tr> <tr><td style="text-align: right;">+185</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">552</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">11</td></tr> </table> <p>Extend to decimals in the context of money.</p>	367	300 + 60 + 7	+185	100 + 80 + 5	12	400 + 140 + 12 = 552	140		400		552		367	+185	552	11	<p><u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Partition into hundreds, tens and ones and recombine</u> Either partition both numbers and recombine or partition the second number only e.g. $358 + 73 = 358 + 70 + 3$ $= 428 + 3$ $= 431$</p> <p><u>Add or subtract the nearest multiple of 10 or 100, then adjust</u> Continue as in Year 2, 3 and 4 but with appropriate numbers e.g. $458 + 79 =$ is the same as $458 + 80 - 1$</p> <p><u>Pencil and paper procedures</u> Extend to numbers with at least four digits $3587 + 675 = 4262$</p> <table style="margin-left: 40px;"> <tr><td style="text-align: right;">3587</td></tr> <tr><td style="text-align: right;">+ 675</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">4262</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">111</td></tr> </table> <p>Revert to expanded methods if the children experience any difficulty. Extend to up to two places of decimals (same number of decimals places) and adding several numbers (with different numbers of digits).</p> <table style="margin-left: 40px;"> <tr><td style="text-align: right;">72.8</td></tr> <tr><td style="text-align: right;">+54.6</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">127.4</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">111</td></tr> </table>	3587	+ 675	4262	111	72.8	+54.6	127.4	111	<p><u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Partition into hundreds, tens, ones and decimal fractions and recombine</u> Either partition both numbers and recombine or partition the second number only e.g. $35.8 + 7.3 = 35.8 + 7 + 0.3$ $= 42.8 + 0.3$ $= 43.1$</p> <p><u>Add the nearest multiple of 10, 100 or 1000, then adjust</u> 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><u>Pencil and paper procedures</u> Extend to numbers with any number of digits and decimals with 1, 2 and/or 3 decimal places. $13.86 + 9.481 = 23.341$</p> <table style="margin-left: 40px;"> <tr><td style="text-align: right;">13.86</td></tr> <tr><td style="text-align: right;">+ 9.481</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">23.341</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">111</td></tr> </table> <p>Revert to expanded methods if the children experience any difficulty.</p>	13.86	+ 9.481	23.341	111
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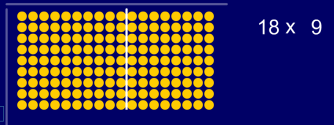
	Subtraction		
Year 1	Year 2	Year 3	
<p>- = signs and missing numbers</p> <p> $7 - 3 = \quad = 7 - 3$ $7 - \quad = 4 \quad 4 = \quad - 3$ $- 3 = 4 \quad 4 = 7 - \quad$ $- \nabla = 4 \quad 4 = \quad - \nabla$ </p> <ul style="list-style-type: none"> Understand subtraction as 'take away'  <ul style="list-style-type: none"> Find a 'difference' by counting up; <p>I have saved 5p. The socks that I want to buy cost 11p. How much more do I need in order to buy the socks?</p>  <ul style="list-style-type: none"> Use practical and informal written methods to support the subtraction of a one-digit number from a one digit or two-digit number and a multiple of 10 from a two-digit number. <p>I have 11 toy cars. There are 5 cars too many to fit in the garage. How many cars fit in the garage?</p> <p style="text-align: right;">-5</p> <p>Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences</p> <p>Recording by</p> <ul style="list-style-type: none"> - drawing jumps on prepared lines - constructing own lines 	<p>- = signs and missing numbers</p> <p>Continue using a range of equations as in Year 1 but with appropriate numbers.</p> <p>Extend to $14 + 5 = 20 -$</p> <p><u>Find a small difference by counting up</u></p> <p>$42 - 39 = 3$</p>  <p><u>Subtract 9 or 11. Begin to add/subtract 19 or 21</u></p> <p>$35 - 9 = 26$</p>  <p><u>Use known number facts and place value to subtract</u> (partition second number only)</p> <p>$37 - 12 = 37 - 10 - 2$ $= 27 - 2$ $= 25$</p>  <p><u>Bridge through 10 where necessary</u></p> <p>$32 - 17$</p> 	<p>- = signs and missing numbers</p> <p>Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Find a small difference by counting up</u></p> <p>Continue as in Year 2 but with appropriate numbers e.g. $102 - 97 = 5$</p> <p><u>Subtract mentally a 'near multiple of 10' to or from a two-digit number</u></p> <p>Continue as in Year 2 but with appropriate numbers e.g. $78 - 49$ is the same as $78 - 50 + 1$</p> <p><u>Use known number facts and place value to subtract</u></p> <p>Continue as in Year 2 but with appropriate numbers e.g. $97 - 15 = 72$</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></p> <p>Complementary addition</p> <p>$84 - 56 = 28$</p> 	



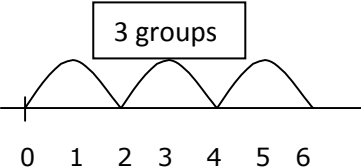

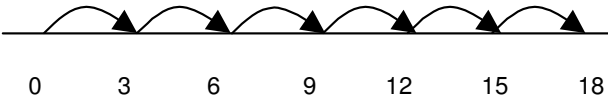
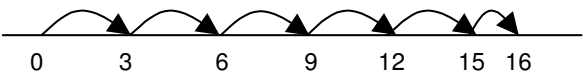
	Subtraction																															
Year 4	Year 5	Year 6																														
<p>- = signs and missing numbers Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p>Find a small difference by counting up e.g. $5003 - 4996 = 7$ This can be modelled on an empty number line (see complementary addition below). Children should be encouraged to use known number facts to reduce the number of steps.</p> <p>Subtract the nearest multiple of 10, then adjust. Continue as in Year 2 and 3 but with appropriate numbers.</p> <p>Use known number facts and place value to subtract $92 - 25 = 67$</p>  <p style="text-align: right;">Pencil</p> <p>and paper procedures Complementary addition $754 - 86 = 668$</p>  <p>For those children with a secure mental image of the number line they could record the jumps only: $754 - 86 = 668$</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">14 (100)</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">600 (700)</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">54 (754)</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right; border-top: 1px solid black;">668</td> <td></td> <td></td> </tr> </table>	14 (100)			600 (700)			54 (754)			668			<p>- = signs and missing numbers 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. $8006 - 2993 = 5013$ This can be modelled on an empty number line (see complementary addition below).</p> <p>Subtract the nearest multiple of 10 or 100, then adjust. Continue as in Year 2, 3 and 4 but with appropriate numbers.</p> <p>Use known number facts and place value to subtract $6.1 - 2.4 = 3.7$</p>  <p style="text-align: right;">Pencil</p> <p>and paper procedures Complementary addition $754 - 286 = 468$</p>  <p>OR $754 - 286 = 468$</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">14 (300)</td> <td>can be refined to</td> <td style="text-align: right;">14 (300)</td> </tr> <tr> <td style="text-align: right;">400 (700)</td> <td></td> <td style="text-align: right;">454 (754)</td> </tr> <tr> <td style="text-align: right; border-top: 1px solid black;">54 (754)</td> <td></td> <td style="text-align: right; border-top: 1px solid black;">468</td> </tr> </table> <p>Reduce the number of steps to make the calculation more efficient. <i>Extend to 2 places of decimals</i></p>	14 (300)	can be refined to	14 (300)	400 (700)		454 (754)	54 (754)		468	<p>- = signs and missing numbers 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. $8000 - 2785 = 5215$ To make this method more efficient, the number of steps should be reduced to a minimum through children knowing:</p> <ul style="list-style-type: none"> ▪ Complements to 1, involving decimals to two decimal places ($0.16 + 0.84$) ▪ Complements to 10, 100 and 100 <p>Subtract the nearest multiple of 10, 100 or 1000, then adjust Continue as in Year 2, 3, 4 and 5 but with appropriate numbers.</p> <p>Use known number facts and place value to subtract $0.5 - 0.31 =$</p>  <p style="text-align: right;">Pencil</p> <p>and paper procedures Complementary addition $6467 - 2684 = 3783$</p>  <p>OR $6467 - 2684 = 3783$</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: right;">16 (2700)</td> <td>can be refined to</td> <td style="text-align: right;">316 (3000)</td> </tr> <tr> <td style="text-align: right;">300 (3000)</td> <td></td> <td style="text-align: right;">3467 (6467)</td> </tr> <tr> <td style="text-align: right; border-top: 1px solid black;">3467 (6467)</td> <td></td> <td style="text-align: right; border-top: 1px solid black;">3783</td> </tr> </table> <p>Reduce the number of steps to make the calculation more efficient. <i>Extend to 2 places of decimals.</i></p>	16 (2700)	can be refined to	316 (3000)	300 (3000)		3467 (6467)	3467 (6467)		3783
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	Multiplication		
Year 1	Year 2	Year 3	
<p>Multiplication is related to doubling and counting groups of the same size.</p>  <p>Looking at columns $2 + 2 + 2$ 3 groups of 2</p> <p>Looking at rows $3 + 3$ 2 groups of 3</p> <p><u>Counting using a variety of practical resources</u> Counting in 2s e.g. counting socks, shoes, animal's legs... Counting in 5s e.g. counting fingers, fingers in gloves, toes... Counting in 10s e.g. fingers, toes...</p> <p>Pictures / marks</p> <p>There are 3 sweets in one bag. How many sweets are there in 5 bags?</p> 	<p><u>x = signs and missing numbers</u> $7 \times 2 = \quad = 2 \times 7$ $7 \times \quad = 14 \quad 14 = \quad \times 7$ $\quad \times 2 = 14 \quad 14 = 2 \times \quad$ $\quad \times \nabla = 14 \quad 14 = \quad \times \nabla$</p> <p><u>Arrays and repeated addition</u></p>  <p>4×2 or $4 + 4$ 2×4 or $2 + 2 + 2 + 2$</p> <p><u>Doubling multiples of 5 up to 50</u> $15 \times 2 = 30$</p> <p><u>Partition</u> Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways: $6 = 5 + 1$ so e.g. Double 6 is the same as double five add double one.</p>  <p>AND double 15</p> $\begin{array}{r} 10 + 5 \\ \downarrow \quad \downarrow \\ 20 + 10 = 30 \end{array}$ <p>OR</p> $\begin{array}{r l} X & 10 \quad 5 \\ \hline 2 & 20 \quad 10 \end{array} = 30$	<p><u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers.</p> <p><u>Arrays and repeated addition</u> Continue to understand multiplication as repeated addition and continue to use arrays (as in Year 2).</p> <p><u>Doubling multiples of 5 up to 50</u> $35 \times 2 = 70$</p> <p><u>Partition</u></p> $\begin{array}{r l l} X & 30 & 5 \\ \hline 2 & 60 & 10 \end{array} = 70$ <p>Use known facts and place value to carry out simple multiplications Use the same method as above (partitioning), e.g.</p> $32 \times 3 = 96$ $\begin{array}{r l l} x & 30 & 2 \\ \hline 3 & 90 & 6 \end{array} = 96$	

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Multiplication

Year 4	Year 5	Year 6																																																						
<p><u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers</p> <p><u>Partition</u> Continue to use arrays:</p>  <p style="text-align: right; margin-right: 10px;">18×9</p> <p>$18 \times 9 = 162$</p> <p>$18 \times 9 = (10 \times 9) + (8 \times 9) = 162$</p> <p>OR</p> <p>Use the grid method of multiplication (as below)</p> <p><u>Pencil and paper procedures</u></p> <p>Grid method 23 x 7 is approximately 20 x 10 = 200</p> <table style="margin-left: 40px;"> <tr> <td>x</td> <td>20</td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>140</td> <td>21</td> <td>=</td> <td>161</td> </tr> </table>	x	20	3			7	140	21	=	161	<p><u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers</p> <p><u>Partition</u> $47 \times 6 = 282$</p> <p>$47 \times 6 = (40 \times 6) + (7 \times 6) = 282$</p> <p>OR</p> <p>Use the grid method of multiplication (as below)</p> <p><u>Pencil and paper procedures</u></p> <p>Grid method 72 x 38 is approximately 70 x 40 = 2800</p> <table style="margin-left: 40px;"> <tr> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">x</td> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">70</td> <td style="border-bottom: 1px solid black; padding: 5px;">2</td> <td></td> <td></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">30</td> <td style="border-right: 1px solid black; padding: 5px;">2100</td> <td style="padding: 5px;">60</td> <td>=</td> <td>2160</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">8</td> <td style="border-right: 1px solid black; padding: 5px;">560</td> <td style="padding: 5px;">16</td> <td>=</td> <td><u>576</u></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right; padding-right: 20px;">2736</td> </tr> </table> <p>Extend to simple decimals with one decimal place.</p>	x	70	2			30	2100	60	=	2160	8	560	16	=	<u>576</u>					2736	<p><u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers</p> <p><u>Partition</u> $87 \times 6 = 522$</p> <p>$87 \times 6 = (80 \times 6) + (7 \times 6) = 522$</p> <p>OR</p> <p>Use the grid method of multiplication (as below)</p> <p><u>Pencil and paper procedures</u></p> <p>Grid method 372 x 24 is approximately 400 x 20 = 8000</p> <table style="margin-left: 40px;"> <tr> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">x</td> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">300</td> <td style="border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">70</td> <td style="border-bottom: 1px solid black; padding: 5px;">2</td> <td></td> <td></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> <td>=</td> <td>7440</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> <td>=</td> <td><u>1488</u></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right; padding-right: 20px;">8928</td> </tr> </table> <p>Extend to decimals with up to two decimal places.</p>	x	300	70	2			20	6000	1400	40	=	7440	4	1200	280	8	=	<u>1488</u>						8928
x	20	3																																																						
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8	560	16	=	<u>576</u>																																																				
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Division		
Year 1	Year 2	Year 3
<p><u>Sharing</u> Requires secure counting skills -see counting and understanding number strand Develops importance of one-to-one correspondence See appendix for additional information on x and ÷ and aspects of number</p> <p>Sharing – 6 sweets are shared between 2 people. How many do they have each?</p>  <p>Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into cups, hoops etc.</p> <p><u>Grouping</u> Sorting objects into 2s / 3s/ 4s etc How many pairs of socks are there?</p>  <p>There are 12 crocus bulbs. Plant 3 in each pot. How many pots are there? Jo has 12 Lego wheels. How many cars can she make?</p>	<p><u>÷ = signs and missing numbers</u> $6 \div 2 = \quad = 6 \div 2$ $6 \div \quad = 3$ $3 = 6 \div \quad$ $\div 2 = 3$ $3 = \div 2$ $\div \nabla = 3$ $3 = \div \nabla$</p> <p><u>Grouping</u> Link to counting and understanding number strand Count up to 100 objects by grouping them and counting in tens, fives or twos;... Find one half, one quarter and three quarters of shapes and sets of objects $6 \div 2$ can be modelled as: There are 6 strawberries. How many people can have 2 each? How many 2s make 6?</p> <p>$6 \div 2$ can be modelled as:</p>  <p>In the context of money count forwards and backwards using 2p, 5p and 10p coins</p> <p>Practical grouping e.g. in PE</p> <p>12 children get into teams of 4 to play a game. How many teams are there?</p> 	<p><u>÷ = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers.</p> <p><u>Understand division as sharing and grouping</u> $18 \div 3$ can be modelled as: Sharing – 18 shared between 3 (see Year 1 diagram) OR Grouping - How many 3's make 18?</p>  <p><u>Remainders</u> $16 \div 3 = 5 \text{ r}1$ Sharing - 16 shared between 3, how many left over? Grouping – How many 3's make 16, how many left over? e.g.</p> 

Division

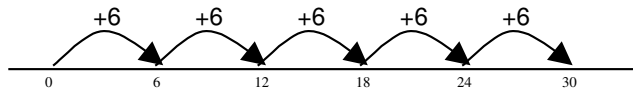
Year 4

÷ = signs and missing numbers

Continue using a range of equations as in Year 2 but with appropriate numbers.

Sharing and grouping

30 ÷ 6 can be modelled as:
grouping – groups of 6 placed on no. line and the number of groups counted e.g.



sharing – sharing among 6, the number given to each person

Remainders

41 ÷ 4 = 10 r1



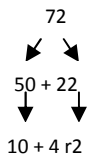
41 = (10 x 4) + 1

Pencil and paper procedures

72 ÷ 5 lies between 50 ÷ 5 = 10 and 100 ÷ 5 = 20

* Partition the dividend into multiples of the divisor:

e.g. $72 = 50 + 22$
 $50 \div 5 = 10$
 $22 \div 5 = 4r2 \rightarrow 10 + 4r2 = 14 r 2$



72	
- 50	(10 groups)
22	
- 20	(4 groups)
2	

Answer : 14 remainder 2

* For a more detailed explanation see paper 'Updating division'.

Year 5

÷ = signs and missing numbers

Continue using a range of equations as in Year 2 but with appropriate numbers.

Sharing and grouping

Continue to understand division as both sharing and grouping (repeated subtraction).

Remainders

Quotients expressed as fractions or decimal fractions
 $61 \div 4 = 15 \frac{1}{4}$ or 15.25



Pencil and paper procedures

256 ÷ 7 lies between 210 ÷ 7 = 30 and 280 ÷ 7 = 40

* Partition the dividend into multiples of the divisor:

e.g. $256 = 210 + 46$
 $210 \div 7 = 30$
 $46 \div 7 = 6r4 \rightarrow 30 + 6r4 = 36r4$

256	OR	256
210 + 46		- 210 (30 groups)
30 + 6r4		46 (6 groups)
		4

Answer: 36 remainder 4

* For a more detailed explanation see paper 'Updating division'.

Year 6

÷ = signs and missing numbers

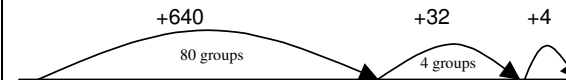
Continue using a range of equations as in Year 2 but with appropriate numbers.

Sharing and grouping

Continue to understand division as both sharing and grouping (repeated subtraction).

Remainders

Quotients expressed as fractions or decimal fractions
 $676 \div 8 = 84.5$

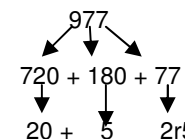


and paper procedures

977 ÷ 36 is approximately 1000 ÷ 40 = 25

* Partition the dividend into multiples of the divisor:

e.g. $977 = 720 + 180 + 77$
 $720 \div 36 = 20$
 $180 \div 36 = 5$
 $77 \div 36 = 2r5 \rightarrow 20 + 5 + 2r5 = 27r5$



977	
- 720	(20 groups)
257	
- 180	(5 groups)
77	
- 72	(2 groups)
5	

Answer: $27 \frac{5}{36}$

* For a more detailed explanation see paper 'Updating division'.

Pencil