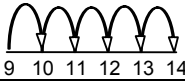
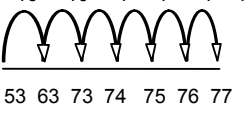
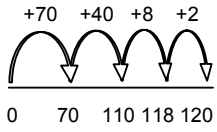
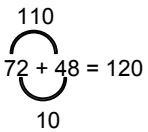
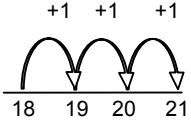
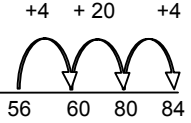


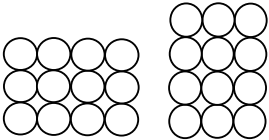
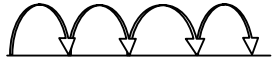

Addition

Method	Combine 2 or more sets. Find total by counting all	Count on from the largest number without partitioning	Count on in 1s 10s or 100s by partitioning the smaller number only	Count on by partitioning both numbers	Partition and add mentally	Expanded column addition	Expanded column addition adding least significant digit first	Column addition using carrying	Other methods
Recording	<p>Use concrete apparatus</p> <p>Record simple number sentences using + and =</p>	<p>Use concrete apparatus</p> <p>Record number sentences using + and =</p> <p>Count on in 1s on a number line</p> <p>9 + 5 =</p> 	<p>53 + 24 = 77</p> <p>+10 +10 +1 +1 +1 +1</p>  <p>53 63 73 74 75 76 77</p>	<p>72 + 48 = 120</p> <p>Start at zero</p> <p>+70 +40 +8 +2</p>  <p>0 70 110 118 120</p>	<p>72 + 48 =</p> <p>70 + 40 = 110</p> <p>8 + 2 = 10</p> <p>110 + 10 = 120</p>	<p>400 20 5 +</p> <p><u>300 10 8</u></p> <p>700 + 30 + 13</p> <p>= 743</p>	<p>342 +</p> <p><u>186</u></p> <p>8</p> <p>120</p> <p><u>400</u></p> <p>528</p>	<p>4 8 2 +</p> <p><u>2 3 9</u></p> <p><u>7 2 1</u></p> <p>1 1</p>	Other methods may be introduced for more able children to investigate
Points to note	Teacher to model calculations on a number line once children have already answered them	Teacher to model calculations on a number line once children have already answered them	Children may use different variations of recording e.g. different size jumps (+20, +4 or +10, +10, +4) as they become more efficient	Children may use different variations of recording e.g. different size jumps (+8, +2 or +10) as they become more efficient	Once children are confident with place value they may record without partitioning e.g.	In preparation for column addition, start by adding the most significant digit first then move children towards adding the least significant digit first	Refer to the value of the digit not the name	When carrying, say carry the 10 (not 1)	
							<p>e.g. 57</p> <p>↙</p> <p>50, not 5</p>		
Mental strategies needed	<p>Know that addition can be done in any order</p> <p>Able to count in 1s</p>	<p>Know that addition can be done in any order</p> <p>Able to count on in 1s</p>	<p>Able to partition 2 (and 3) digit numbers</p> <p>Able to count on in 10s, 1s (and 100s)</p> <p>Know all addition facts to 9 + 9 and all complements to 10</p> <p>Able to add multiples of (100) 10 and 1 mentally</p>		<p>Secure understanding of place value</p> <p>Able to add mentally a multiple of (100) 10 and 1</p>				

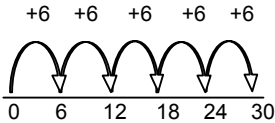
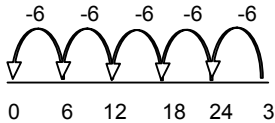
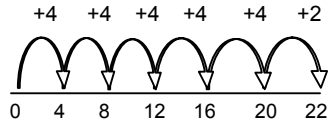
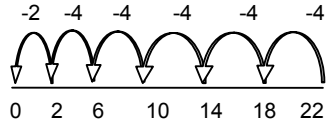
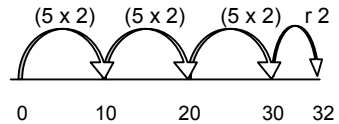
Subtraction

Count on					Count back				
Method	Understand subtraction as 'finding the difference between' and 'how many more to make'	Count on from the smaller number in 1s without partitioning	Count on from the smaller number using a number line	Count on from the smaller number set out in columns	Understand subtraction as 'taking away'	Partition 1 number and subtract	Partition both numbers and subtract	Partition and subtract Leading to column subtraction	Other methods
Recording	Record simple number sentences using - and = symbols	$21 - 18 = 3$ 	$84 - 56 = 28$ 	$527 -$ $\underline{186}$ 4 (to make 190) 10 (to make 200) 300 (to make 500) $\underline{27}$ (to make 527) 341	Record simple number sentences using - and = symbols	$83 - 51$ $= 83 - 50 - 1$ $= 33 - 1$ $= 32$	$400 \ 80 \ 3 -$ $\underline{100 \ 50 \ 1}$ $300 \ 30 \ 2$	$23 \overset{1}{\cancel{}} 8 -$ $\underline{1 \ 7 \ 5}$ $1 \ 4 \ 3$	Other methods may be introduced for more able children to investigate
Points to note	Teacher to model calculations on a number line once children have already answered them	Teacher to model calculations on a number line once children have already answered them	Children may use different variations of recording e.g. different size jumps as they become more efficient	Children would not need to record the information inside brackets for each calculation	Teacher to model calculations on a number line once children have already answered them	Children may use different variations of recording e.g. different size jumps (-10,-10,-10,-1,-1 or -30,-2) as they become more efficient	For the example above say, "3 - 7 would give a negative value", rather than, "You can't do it"	Remember to always refer to the value of the digit e.g. $\overset{1}{\cancel{}} 57$ 50, not 5	
Mental strategies needed	Able to count on in 1s		Able to partition numbers Able to count on in (100s) 10s and 1s		Able to count back in 1s	Able to partition a number into (100s) 10s and 1s			
					Recall of addition and subtraction facts to 20	Secure understanding of place value			
						Able to partition numbers in different ways e.g. $57 = 50 + 7$ or $40 + 17$			
						Able to count back in (100s) 10s and 1s			
						Able to add a multiple of 100, 10 and 1 mentally			

Multiplication

Method	Understand multiplication as arrays Describe an array as repeated addition	Repeated addition on a number line	Grid method	Grid method	Multiply without a grid	Other methods															
Recording	$3 \times 4 =$  Record mental calculations using x and = signs	$7 \times 4 = 28$ $+7 \quad +7 \quad +7 \quad +7$  0 7 14 21 28	18×5 <table border="1" data-bbox="863 521 1052 586"> <tr><td>x</td><td>10</td><td>8</td></tr> <tr><td>5</td><td>50</td><td>40</td></tr> </table> $50 + 40 = 90$	x	10	8	5	50	40	23×35 <table border="1" data-bbox="1203 521 1392 618"> <tr><td>x</td><td>20</td><td>3</td></tr> <tr><td>30</td><td>600</td><td>90</td></tr> <tr><td>5</td><td>100</td><td>15</td></tr> </table> $600 + 100 + 90 + 15 = 805$	x	20	3	30	600	90	5	100	15	17×32 $10 \times 30 = 300$ $10 \times 2 = 20$ $7 \times 30 = 210$ $7 \times 2 = \underline{14}$ $ = 544$	Other methods may be introduced for more able children to investigate
x	10	8																			
5	50	40																			
x	20	3																			
30	600	90																			
5	100	15																			
Points to note	Begin to see links between tables e.g. $7x = 5x + 2x$	Make links to division by linking to repeated subtraction	Ensure children understand and use the place value of a number to multiply 2 numbers together Use factorising to help understand multiplication of multiples of 10 e.g. $40 \times 30 = (4 \times 10) \times (3 \times 10) = 4 \times 3 \times 10 \times 10 = 1200$ Ensure children have necessary addition skills to add up the grid total	Have a method of keeping track of which digits have been multiplied e.g. 																	
Mental strategies needed	Know that multiplication can be done in any order Begin to know some multiples of 2, 5 and 10	Able to count on in steps of a constant size (know multiples) Use known facts where appropriate e.g. doubles	Know multiplication facts up to 10×10 Able to multiply a single digit by a multiple of 10 e.g. $50 \times 6 = 300$	Know multiplication facts up to 10×10 Able to multiply a single digit by a multiple of 10 e.g. $50 \times 6 = 300$ using known facts Able to multiply 2 multiples of 10 e.g. $60 \times 30 = 1800$ using known facts																	

Division

Method	Understand division as sharing	Understand division as grouping	Repeated addition or subtraction on a number line	Repeated addition or subtraction showing remainders on a number line	Partition into chunks of the divisor	Partition into chunks of the divisor with remainders	Other methods
Recording	<p>Share equally using concrete apparatus</p> <p>Record simple calculations using \div and $=$ signs</p>	<p>Group using concrete apparatus or by saying "How many ___'s make ___"</p> <p>Record simple calculations using \div and $=$ signs</p>	<p>$30 \div 6 = 5$</p> <p>(Start at 0)</p>  <p>0 6 12 18 24 30</p> <p>(or start at 30)</p>  <p>0 6 12 18 24 30</p>	<p>$22 \div 4 = 5 \text{ r } 2$</p> <p>(Start at 0)</p>  <p>0 4 8 12 16 20 22</p> <p>(or start at 22)</p>  <p>0 2 6 10 14 18 22</p>	<p>$75 \div 5 = 15$</p> <p>$50 (10 \times 5)$ $\underline{25} (5 \times 5)$</p> <p>$75 (15 \times 5)$</p> <p>$= 15$</p>	<p>$107 \div 8$</p> <p>$80 (10 \times 8)$ $\underline{24} (3 \times 8)$</p> <p>$104 (13 \times 8)$</p> <p>$= 13 \text{ r } 3$</p> <p>Chunk by counting on or back</p>	Other methods may be introduced for more able children to investigate
Points to note	As they become more efficient, children will share by giving more than 1 each time	Make links to multiplication by counting on and back in multiples of the divisor	<p>When using repeated subtraction, this can be difficult if the starting number is not a multiple of the divisor</p> <p>Children will make bigger jumps as become more efficient e.g. $32 \div 5 = 6 \text{ r } 2$</p>  <p>0 10 20 30 32</p>	<p>May make bigger jumps as become more efficient</p> <p>Could still model on a number line if needed</p>	<p>If doing by repeated subtraction, children may need to keep a running total of what is left</p> <p>e.g. $137 \div 9$</p> <p>$137 -$ $\underline{90} (10 \times 9)$ $47 -$ $\underline{45} (5 \times 9)$ 2</p> <p>$= 15 \text{ r } 2$</p>		
Mental strategies needed	Able to count in 1s (or however many are being given each time)	<p>Able to count in multiples of the divisor</p> <p>Use known facts where appropriate e.g. halves</p>	Knowledge of multiplication facts and division facts to 10×10	<p>Able to partition in different ways e.g. $75 = 70 + 5$ or $50 + 25$</p> <p>Know multiplication tables</p> <p>Able to add/subtract in order to keep a running total</p>			