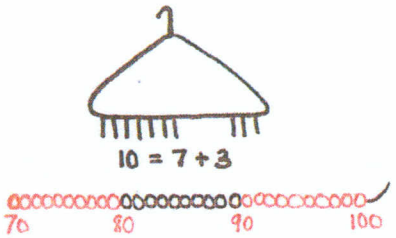
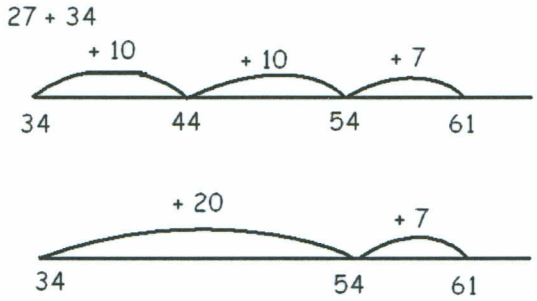
Rudgwick Primary School Calculation Policy 2010

Area	Pre-requisites	Jottings to support Mental Calculations	Expanded Written Method	Compact Written Method
+	• Addition can be done **in any order** 34 + 56 or 56 + 34 • Usually start with the **biggest** number • Must know **number bonds to 10** and addition facts for all single-digit numbers • Count forward in steps of 1, 10 and 100 along a numberline • Understand the numberline as a continuum • Concrete apparatus available • Understand place value - can partition numbers • Counting forwards and backwards in steps of different sizes  	The answer is on the numberline  27 + 34 30 + 4 + 20 + 7 50 + 11 = 61	27 + 34 Least significant → Most significant 34 + 27 = 11 + 50 = 61 494 + 368 = 12 + 150 + 700 = 862 400 + 90 + 4 + 300 + 60 + 8 700 + 150 + 12 400 + 90 + 4 + 300 + 60 + 8 800 + 60 + 2 100 10	494 + 368 862 1 1 Extend to decimals and larger numbers

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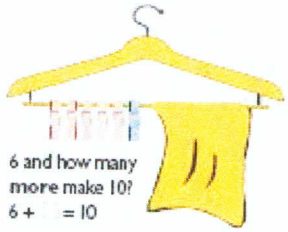
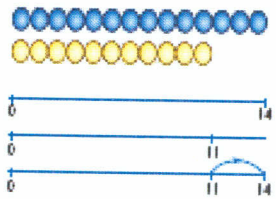
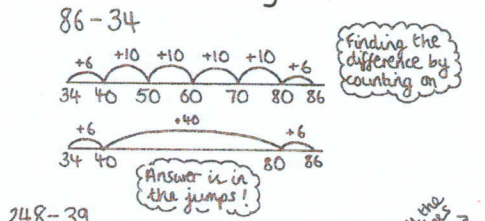
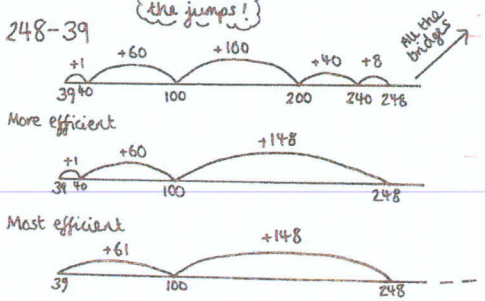
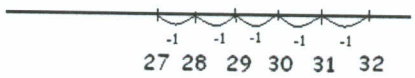
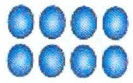
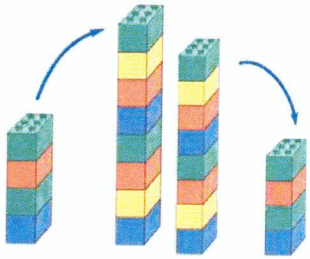
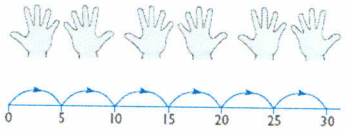
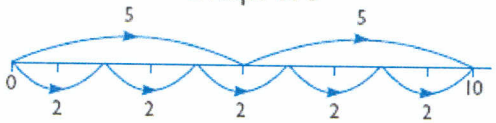
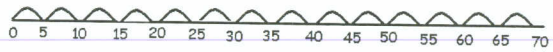
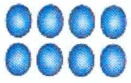
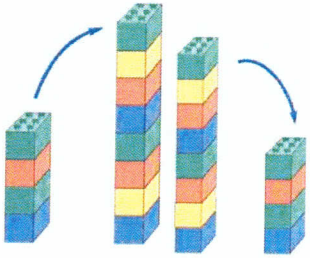
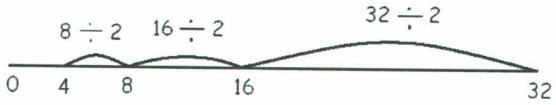
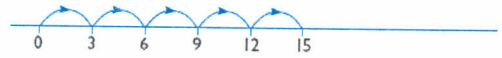
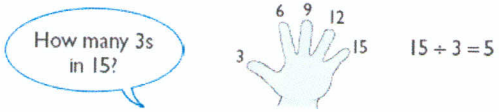
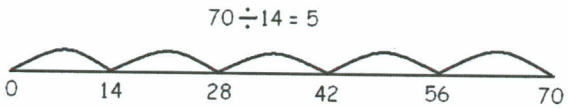
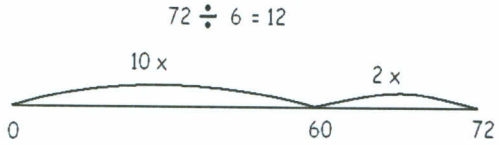
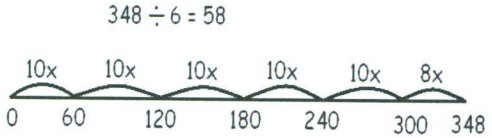
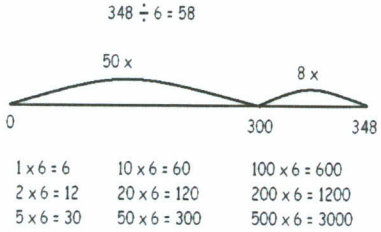
[redacted]	• Subtraction can be seen as:
	  ○ Taking Away (Counting Back)
	  ○ Finding the Difference (Counting on)
	• Number bonds to 10
	• Complements of 100
	• Count on/back in 1s/10s on a numberline
	• Understand the numberline as a continuum
	• Addition/Subtraction inverses (trios)
	• Concrete apparatus available
	• Understanding of place value
	• Counting forwards / backwards in steps of different sizes
		
		 
		The difference between 11 and 14 is 3.
		14 – 11 = 3
		11 + = 14
		Finding the Difference by Counting On
		 
		 
		Taking Away by Counting Back
		32 - 5
		 
			74
			– 27
			3 (→30)
			40 (→70)
			4 (→74)
			47
			
			326
			– 178
			2 (→180)
			20 (→200)
			100 (→300)
			20 (→320)
			6 (→326)
			148
				74
				– 27
				3 (→30)
				44 (→74)
				47
				
				326
				– 178
				22 (→200)
				126 (→326)
				148

Area	Pre-requisites	Jottings to support Mental Calculations	Expanded Written Method	Compact Written Method
×	• understand the value of each digit • group sets of objects reliably  • recognise sequences of numbers • addition and subtraction of numbers • multiplication facts  $4 \times 2 = 8$ $2 \times 4 = 8$  $2 \times 4 = 8$ $4 \times 2 = 8$ • That multiplication and division are inverse • doubling and halving  double 4 is 8 $4 \times 2 = 8$ half of 8 is 4 $8 \div 2 = 4$	U xU Repeated addition using a numberline  $5+5+5+5+5+5=30$ $5 \times 6 = 30$ 5 multiplied by 6 6 groups of 5 6 hops of 5 Recording the jumps (how many groups...) 2 hops of 5  5 hops of 2 TU x U 14 x 5 Multiplication is repeated addition  Use table facts to make bigger jumps  14 x 5 =70	TU x U Grid Method X | 20 | 3 | 8 | 160 | 24 | 184 Expanded Method 23 ×8 160 (20 × 8) 24 (3 × 8) 184 TU x TU Grid Method X | 40 | 6 | 30 | 1200 | 180 | 1380 2 | 80 | 12 | 92 | | | 1472 Expanded Method 46 ×32 1200 (40 × 30) 180 (6 × 30) 80 (40 × 2) 12 (6 × 2) 1472	TU x U Compact Method 23 ×8 184 2 TU x TU Compact Method 46 ×32 1380 (46 × 30) 92 (46 × 2) 1472 All methods can be extended to decimal calculations

Area	Pre-requisites	Jottings to support Mental Calculations	Expanded Written Method	Compact Written Method
÷	• understand the value of each digit • group sets of objects reliably  • recognise sequences of numbers • addition and subtraction of numbers • multiplication facts  4 × 2 = 8 2 × 4 = 8  2 × 4 = 8 4 × 2 = 8 • That multiplication and division are inverse • Finding half and quarter • doubling and halving  double 4 is 8 4 × 2 = 8 half of 8 is 4 8 ÷ 2 = 4	<u>÷ by 2, 4 and 8</u> Use halving methods with a numberline to support 32 ÷ 8 = halve, halve and halve again  <u>TU ÷ U</u> Recall multiplication facts up to 10 x 10 and derive division facts. E.g. 5 x 4 = 20, so 20 ÷ 5 = 4 and 20 ÷ 4 = 5 <u>Repeated addition using a numberline</u>   Extend to: e.g. 70 ÷ 14 = 5  The answer is the number of jumps	<u>TU ÷ U</u>  <u>HTU ÷ U</u>  	Becoming more efficient by using less jumps e.g.  1 x 6 = 6 2 x 6 = 12 5 x 6 = 30 10 x 6 = 60 20 x 6 = 120 50 x 6 = 300 100 x 6 = 600 200 x 6 = 1200 500 x 6 = 3000 All methods can be extended to decimal calculations