



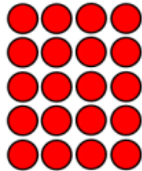
St Barnabas

Church of England Primary Academy

A member of **CDARI**

St Barnabas Mental Calculations Progression Document

Year group	Addition and Subtraction Mental Calculation Skills (Working mentally with jottings)	Methods or Strategies	Multiplication and Division Mental Calculation Skills (Working mentally with jottings)	Methods or Strategies
Year 1	<ul style="list-style-type: none"> - Number bonds to 10. - Add and subtract a pair of single digit numbers (not crossing 10) e.g. $4 + 5$, $8 - 3$ - Add or subtract a single digit number from a teen number (not crossing 10 or 20) e.g. $13 + 5$, $17 - 4$ - Add or subtract a single digit number to or from 20. - Add near doubles within 10. e.g. $5 + 6$ - Add a multiple of 10 to a single digit number. e.g. $7 + 10$, $7 + 20$ 	<ul style="list-style-type: none"> - Reorder numbers when adding e.g. put the largest number first. - Count back in ones, twos or tens. - Partition and combine tens and ones <div style="text-align: center; margin: 10px 0;"> <p>30 → 7 37</p> </div> <p style="text-align: center;">$30 + 7 = 37$</p> <ul style="list-style-type: none"> - Double and adjust 	<ul style="list-style-type: none"> - Count on from or back to zero in ones, twos, fives or tens. 	<ul style="list-style-type: none"> - Use the patterns of the last digit. <p>e.g.</p> <p>Twos - digits end in 2, 4, 6, 8, 0</p> <p>Fives - digits end in 0 or 5</p> <p>Tens - digits end in a zero</p> <p>This will help them make the link that a number can be in</p>


		$5 + 6 = 5 + 5 + 1$		different times tables.
Year 2	<ul style="list-style-type: none"> - Add and subtract a pair of single digit numbers (crossing 10) e.g. $5 + 8$, $11 - 7$ - Add any single digit number to or from a multiple of 10 e.g. $60 + 5$ - Subtract any single digit number from a multiple of 10. e.g. $80 - 7$ - Add or subtract any single - digit number to or from a two-digit number. Including crossing the tens boundary. e.g. $23 + 5$, $27 - 3$ $28 + 6$, $33 - 5$ - Add or subtract any multiple of 10 to or from any two - digit number e.g. $27 + 60$, $83 - 40$ - Add numbers such as 9, 19, 29 and 11, 21, 31 - Add near doubles of numbers in the teens. e.g. $15 + 14$, $12 + 13$ 	<ul style="list-style-type: none"> - Reorder numbers when adding e.g. put the largest number first. - Partition small numbers in order to bridge through 10 and multiples of 10. When adding and subtracting. - Partition and combine multiples of tens and ones. - Use knowledge of pairs making 10. - Count on in tens and ones to find the total. - Count on or back in tens and ones to find the difference. - Add a multiple of 10 and adjust by 1. - Double and adjust. 	<ul style="list-style-type: none"> - Double any multiple of 5 up to 50 e.g. double 35 - Halve any multiple of 10 up to 100. e.g. halve 70 - Find half of even numbers to 40. e.g. half of 44 - Find the total number of objects when they are organised into groups of 2, 5 and 10. 	<ul style="list-style-type: none"> - Partition: double the tens and ones separately and then recombine - Use the knowledge that halving is the inverse of doubling and doubling is the same as multiplying by 2. - Use knowledge of multiplication facts from the 2, 5 and 10 times table. e.g. There are 20 objects because there are 10 groups of 2.
Year 3	<ul style="list-style-type: none"> - Add and subtract a group of small numbers 	<ul style="list-style-type: none"> - Identify pairs totalling ten 	<ul style="list-style-type: none"> - Double any multiple of 5 up to 100 e.g. double 35 	<ul style="list-style-type: none"> - Partition: double the tens

	<p>e.g. $4 - 3 + 2$</p> <ul style="list-style-type: none"> - Add or subtract a two - digit number to or from a multiple of 10 <p>e.g. $60 + 28, 72 - 40$</p> <ul style="list-style-type: none"> - Add and subtract two - digit numbers that don't bridge over a multiple of 10. <p>e.g. $53 + 42, 78 - 54$</p> <ul style="list-style-type: none"> - Add near doubles of numbers within 50. <p>e.g. $18 + 17, 44 + 45$</p> <ul style="list-style-type: none"> - Count on and back in minutes and hours through 60 (analogue). 	<ul style="list-style-type: none"> - Count on or back in tens from any number. - Partition: Add and subtract tens and ones separately and recombine. - Partition: Count on in tens and ones to find the total. - Partition: Count on or back in tens and ones to find the difference. - Double and adjust <p>E.g. $18 + 17 = 18 + 18 - 1$</p>	<ul style="list-style-type: none"> - Halve any multiple of 10 up to 200. <p>e.g. halve 170</p> <ul style="list-style-type: none"> - Multiply one-digit and two-digit numbers by 10 and 100. <p>e.g. $7 \times 10, 7 \times 100, 46 \times 10, 46 \times 100$</p> <ul style="list-style-type: none"> - Find unit fractions of quantities. This should include: Halves, thirds, quarters, fifths and tenths 	<p>and ones separately and then recombine</p> <ul style="list-style-type: none"> - Halve the hundreds, tens and ones separately and recombine. - Recognise that finding a unit fraction is the equivalent of dividing by the denominator. - Recognise that halving and doubling are inverse operations. - Use knowledge of division facts. - Recognise that when a number is multiplied by 10 or 100 the digits move one or two places to the left and 0 is used as a placeholder.
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<p>Year 4</p>	<ul style="list-style-type: none"> - Add any pair of 2 digit numbers that cross the 10 and 100 boundary. e.g. $38 + 76$, $83 - 26$ - Add or subtract a near multiple of 10 e.g. $34 + 39$, $87 - 49$ - Add near doubles of any 2 digit numbers e.g. $66 + 67$, $72 + 73$ - Add or subtract two - digit and three - digit multiples of ten e.g. $120 - 40$, $230 + 320$ - Count on and back in minutes and hours through 60 (analogue and digital) 	<ul style="list-style-type: none"> - Count on or back in hundreds, tens or ones. - Partition: Add tens and ones separately and then recombine. - Partition: Subtract tens and then ones E.g. If you subtract 34, subtract 30 and then 4. - Subtracting by counting up from the smaller number to the larger number. - Add or subtract a near multiple of 10 and then adjust. e.g. $34 + 39 = 34 + 40 - 1$ $87 - 49 = 87 - 50 + 1$ - Double and adjust. - Use knowledge of place value e.g. $120 - 40$ use $12 - 4 = 8$ $230 + 320$ use $23 + 32$ 	<ul style="list-style-type: none"> - Double any two-digit number. e.g. double 37 - Double and halve any multiple of 10 and 100 e.g. double or half of 800, double or half of 420. - Halve any even number to 200. - Find unit fractions and simple non-unit fractions of quantities. e.g. $1/8$ of 32, $4/8$ of 32, - Multiply and divide numbers to 1000 by 10 and 100 (answers with whole numbers only) e.g. 456×10, 800 divided by 10, 42×100 - Multiply a multiple of 10 to a hundred by a one-digit number. e.g. 60×3, 40×4 - Multiply numbers to 20 by a one-digit number. e.g. 19×4 - Identify the remainder when dividing by 2, 5 and 10 - Give the factor pair of a number e.g. 6 has a factor pair of 2 and 3. 	<ul style="list-style-type: none"> - Partition: double the tens and ones separately and then recombine - Recognise that when a number is multiplied or divided by 10 or 100 the digits move one or two places to the left or right and 0 is used as a placeholder. - Use knowledge of multiplication facts and place value. - Use partitioning and distributive law to multiply. e.g. $14 \times 3 = (10 + 4) \times 3$ $10 \times 3 = 30$ $4 \times 3 = 12$ $30 + 12 = 42$
<p>Year 5</p>	<ul style="list-style-type: none"> - Add or subtract a pair of 	<ul style="list-style-type: none"> - Count on or back 	<ul style="list-style-type: none"> - Multiply any two-digit number by 	<ul style="list-style-type: none"> - Multiply or

	<p>two-digit numbers or three-digit multiples of 10. e.g. $30 + 90$, $360 - 240$, $220 + 460$</p> <ul style="list-style-type: none"> - Add or subtract a near multiple of 10 or 100 to any two-digit or three-digit number. e.g. $34 + 39$, $87 - 49$, $432 + 190$, - Find the difference between two near multiples of 100 and 1000 (count up the difference by using a number line, bridge through multiples of 100). e.g. $6800 - 3040$, $608 - 375$ - Add or subtract any pairs of decimal fractions with ones and tenths. e.g. $5.6 + 2.6$, $6.5 - 3.8$ - Count on or back in minutes and hours bridging through 60 (analogue and digital times) e.g. mental jottings (time number line) 	<p>in hundreds, tens, ones and tenths.</p> <ul style="list-style-type: none"> - Partition: Add hundreds, tens and ones separately and then recombine. - Subtract by counting up from a smaller to a larger number (only when it is the most efficient method). - Add or subtract a multiple of 10 or 100 and adjust. e.g. $264 + 88$ (add 90 and subtract 2), $826 - 198$ (subtract 200 and add 2). - Double and adjust.. - Use knowledge of place value and related calculations. e.g. $7.2 - 4.3$ using $72 - 43$. 	<p>4 and 8. e.g. 32×4, 88 divided by 8</p> <ul style="list-style-type: none"> - Multiply two-digit numbers by 5 or 20 using doubling or halving. e.g. 42×20, 36×5 - Multiply by 25 and 50. e.g. 42×25, 36×50 - Double of 3 digit multiples of 10 to 500 and corresponding halves. e.g. 240×2, 480 divided by 2 - Find remainders when dividing a 2 digit number by a single digit number. e.g. 34 divided by 8 = 4 R2 - Multiply and divide whole numbers and decimals by 10, 100 or 1000. e.g. 7.2×1000, 68 divided by 100, 4.2×10 - Multiply a pair of multiples of 10 and a multiply a multiple of 100 by a single digit. e.g. 40×60, 400×8 - Divide a multiple of 10 by a single digit number (whole number answers only) e.g. 320 divided by 4. - Find fractions of whole numbers or quantities. 	<p>divide by 4 or 8 by repeated doubling and halving.</p> <ul style="list-style-type: none"> - Form an equivalent calculation e.g. Multiply by 5 by multiplying by 10 and halving. Multiply by 20 by doubling and times by ten. - Use knowledge of doubles and halves and place value. E.g. When you multiply by 50, multiply by 100 and halve the answer. - Use knowledge of division facts when finding a remainder. - Use understanding that when you multiply or divide a number by 10
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			<p>e.g. $\frac{3}{8}$ of 64, $\frac{2}{3}$ of 30</p> <ul style="list-style-type: none">- Find 10, 25 and 50% of whole numbers and quantities. <p>e.g. 10% of 80, 25% of 80</p> <ul style="list-style-type: none">- Factor pairs of numbers to 100 <p>e.g. 42 has factor pairs of: 42 and 1 21 and 2 14 and 3 7 and 6</p>	<p>and 100, its digits move 1 or 2 places to the left or right.</p> <ul style="list-style-type: none">- Use knowledge of multiplication and division facts and understanding of place value when calculating with multiples of 10.- Use knowledge of equivalence between fractions and percentages. <p>50% = $\frac{1}{2}$ 25% = $\frac{1}{4}$ 10% = $\frac{1}{10}$</p> <ul style="list-style-type: none">- Use knowledge of multiplication and division facts to find factor pairs.
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				 <p>This can be done by creating factor rainbows.</p>
<p>Year 6</p>	<ul style="list-style-type: none"> - Add or subtract a pair of decimals with ones, tenths or hundredths. e.g. $0.7 + 3.36$ - Find doubles of decimals each with ones and tenths e.g. $1.2 + 1.2$ - Add near doubles of decimals. e.g. $1.6 + 1.7$ - Add or subtract a decimal with ones and tenths, that is nearly a whole number. e.g. $5.2 + 3.6$ - Count on and back in minutes and hours bridging through 60 (analogue and digital times, 12 hour, 24 hour clock) 	<ul style="list-style-type: none"> - Count on or back in hundreds, tens, ones, tenths and hundredths. . - Use knowledge of place value and related calculations e.g. $4.7 + 5.6$, $470 + 560$, $0.56 + 0.47$ can be worked out using $47 + 56$ - Use knowledge of place value and doubles of two-digit whole numbers. - Double and adjust. - Add or subtract a 	<ul style="list-style-type: none"> - Multiply pairs of two-digit and single-digit numbers. e.g. 28×3 - Divide a two-digit number by a single-digit number e.g. 68 divided by 4. - Divide by 25 or 50. e.g. 480 divided by 25, 2700 divided by 50 - Double decimals with ones and tenths and the corresponding halves. e.g. double 7.6, half of 15.2 - Multiply pairs of multiples of 10 and 100 e.g. 50×30, 700×20 - Divide multiples of 100 by a multiple of 10 or 100. e.g. 800 divided by 400, 600 divided by 20 	<ul style="list-style-type: none"> - Use partitioning and distributive law to divide tens and ones separately. e.g. 92 divided by 4 = $(80 + 12)$ divided by 4 = $20 + 3 = 23$ - Form equivalent calculations. e.g. To divide by 25, divide by 100 and multiply by 4. To divide by 50, divide by 100 and then double. - Use knowledge of equivalence between fractions and percentages

	<p>e.g. mental jottings (time number line)</p>	<p>whole number and adjust. e.g. $5.2 + 3.6 = 3.6 + 5 + 0.2$</p>	<ul style="list-style-type: none"> - Multiply and divide two-digit decimals using place value knowledge. e.g. 4.8 divided by 6 (48 divided by 6 is 8, then divide by 10 is 0.8) - Find 10% or multiples of 10% of whole numbers and quantities. e.g. 40% of £30, 70% of 200g - Simplify fractions by cancelling. - Scale up and down using known facts. - Identify numbers with odd and even numbers of factors, and no factor pairs other than one and themselves. 	<p>and relationship between fractions and division.</p> <ul style="list-style-type: none"> - Recognise how to scale up or down using multiplication and division. e.g. If three oranges cost 24p, one orange costs $24 \div 3 = 8$. 4 oranges would cost $8 \times 4 = 32$p - Use multiplication and division facts to identify factor pairs and numbers with only two factors.
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