**St Bridget’s Calculations Policy**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| + | | Foundation 2  (EYFS/NC 1c) | Year 1  (Stage 1: NC 1b/1a) | | Year 2  (Stage 2: NC 2c/2b) | |
| Key  Vocabulary | | Count to,  Count on, altogether  One more, total,  Add, more, and, sum, | + equal to, one more, plus, add, total, how many altogether? What is the sum of? | | + more, many, addition, 10/100, boundary, increase, inverse. | |
| Mental  strategies | | Counting on in ones from different starting points up to 10 | + recall all pairs of numbers with a total of 10. Say the number that is one more, and possibly 10 more, than any given number to 10. Begin to introduce doubles. | | Recall addition facts for each number to 10 and possibly 20.  Add 10 to multiples of 10 and any given number.  Begin to use number facts to 10 and knowledge of place value to add multiples of 10 e.g. 7+3=10 70+30=100  + 9/11 to a given number. | |
| Written strategies | | Children are encouraged to develop a mental picture of the number system in their heads through access to a wide range of counting equipment, everyday objects and number lines.  **0,1,2,3,4,5,6,7,8,9,10**  Recognise numbers  0-10  1, 2, 3, 4, 5, 6...there are 6 teddies.  **Count reliably up to 10 everyday objects.** | Children understand addition as combining any number of groups. Can find one more/10 more, than a given set of objects. In practical contexts they understand + and counting on. They are developing ways of recording calculation using pictures etc. This will be developed alongside use of the equals sign.  + = 6  **Teachers will demonstrate the use of number lines**.  3+2=5 count along a number line to add numbers together  0 1 2 3 4 5 7  Partitioning a 2 digit number. | | Children will use number lines and practical resources to support calculation and **teachers will demonstrate the use of number lines**.  Partition a 3 digit number.  Children will then begin to use number lines, and 100 squares, to support their own calculations using a number line to count on in ones. They will build on from this and count in methods other than on ones.  Children will begin to use empty number lines themselves starting with the larger number and counting on.  **First in tens and ones**:  34 44 54 55 56 57  34+23=57  **Then helping children add units on one jump by using known facts** (4+3=7)  **Followed by tens in one jump and units in one jump.**  Introduce models and images to help support partitioning of numbers (Dienes apparatus/arrow cards).  **Partition a 2 digit number into tens and ones:**   1. Partition both numbers and recombine 2. Count on by partitioning the second   48+35= 36+53=  40+30=70 53+30+6  8+ 5= 13 83+ 6=89  70+13=83  **Partition a three digit number into multiples of 100, 10 and 1 in different ways.**  127=100+20+7 | |
| At each stage, where appropriate, children will: | | * use strategies to add several numbers with different numbers of digits. * Begin to add 2 or more sums of money, with or without adjustment from pence to pounds. * Apply strategies to other areas of maths – adding times, weights, lengths etc. * Know that decimal points should line up beneath each other, particularly when adding mixed amounts. * Begin to add two or more decimals with up to three digits and the same number of decimal places. | | | | |
| + | Year 3  (Stage 3: 2a/3b | | | Year 4  (Stage 4: NC3a/4b) | | Year 5/6  (Stage 5: 4a/5) |
| Key  Vocabulary | Consolidation of previous language acquired + integer. | | | | | |
| Mental  strategies | Recall addition facts up to 20.  Count forward in 10’s from any given number.  +19/21 to a given number.  Use mental recall of addition and subtraction facts to 20 to solve problems involving larger numbers.  Use inverse to find missing whole numbers. e.g. I think of a number, take 5 away, the answer is 35, what is my number? | | | Calculate complements to 100.  Use compensation to add numbers mentally e.g. 49 50=1.  Add two 2 digit numbers mentally by partitioning e.g.  40+20=60  5+3 = 8  =68 | | Calculate complements to 1000.  Recall decimal complements to 1.  **Partition into thousands, hundreds, tens, ones, decimal fractions and recombine:**  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 |
| Written strategies | Children will begin to use empty number lines themselves starting with the larger number and counting on.  **First in tens and ones**:  34 44 54 55 56 57  34+23=57  **Then helping children add units on one jump by using known facts** (4+3=7)  **Followed by tens in one jump and units in one jump.**  Introduce models and images to help support partitioning of numbers (Dienes apparatus/arrow cards).  **Partition a 2 digit number into tens and ones:**   1. Partition both numbers and recombine 2. Count on by partitioning the second   48+35= 36+53=  40+30=70 53+30+6  8+ 5= 13 83+ 6=89  70+13=83  **Partition a three digit number into multiples of 100, 10 and 1 in different ways.**  127=100+20+7  **Develop and use written methods to record, support or explain addition of two-digit and three digit numbers**  (add a near multiple of 10 to a 2 digit number)  35+19 is the same as 35+20-1  (children need to be secure adding multiples of 10 to any 2 digit number).  Pencil and paper procedures:  83+42=125  +83 80+3  42 40+2  5 120+5 176+58  120  125 | | | **Expanded written calculations for addition will be developed when the child can do the following mentally:**   * Add two single digit numbers quickly * Add multiples of 10 quickly * Partition numbers into thousands, hundreds, tens and units * Add two digit numbers mentally and record the method informally e.g. empty number line   **Confidently partition 3 &4 digit numbers into thousands hundreds tens and units (as at stage 3)**  **Refine and use written methods to add 3&4 digit numbers, including £ and p.**  367 300+60+7 extend method  +185 100+80+5 367  12 400+140+12=552 + 185  140 552  400 11  552  Move to record as follows:  2604.13  + 137.28  2741.41 | | **Partition into thousands, hundreds, tens, ones, decimal fractions and recombine:**  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  **Use efficient written methods to add and subtract integers and decimals: add the nearest multiple of 10, 100 or 1000 then adjust.**  **Pencil and paper procedures:**  Extend to numbers with any number of digits and decimals with 1, 2 and or 3 decimal places.  13.86 +9.481= 23.341  13.86  + 9.481  23.341  1 1 1  The expanded method leads children into the more compact method so that they understand the structure and efficiency. Revert to the expanded method if the child experiences any difficulty. |
| At each stage, where appt, children will: | * Use strategies to add several numbers with different numbers of digits. * Begin to add 2 or more sums of money, with or without adjustment from pence to pounds. * Apply strategies to other areas of maths – adding times, weights, lengths etc. * Know that decimal points should line up beneath each other, particularly when adding mixed amounts. * Begin to add two or more decimals with up to three digits and the same number of decimal places. | | | | | |
| - | | Foundation 2  (EYFS/NC 1c) | Year 1  (Stage 1: NC 1b/1a) | | Year 2  (Stage 2: NC 2c/2b) | |
| Key  Vocabulary | | Count back, less, few, one less, take, take away, leave, difference. How many left? How many fewer? | + 1 less, subtract, minus, leave. How much less? Difference between, fewer. | | +subtraction; difference between; how many is fewer is \*\*than \*\*? | |
| Mental  strategies | | Counting backwards from different starting points with numbers up to 10. | Say the number that is 1 less, and 10 less, than any given number up to 20. Recall facts for number sup to 10. | | Recall subtraction facts for each number to 20 e.g. 10-8, 10-9, 5+\_=10 etc. Count back in multiples of 10 from a multiple of 10 and any given number. – 9/11 from any given number and compensating. | |
| Written strategies | | Children are encouraged to develop a mental picture of the number system, models will be used by the teacher to demonstrate what happens as the children count back within number rhythms and stories.  Ten green bottles... | Children will develop an understanding of the subtraction sign through appropriate contexts. They understand subtraction as **‘taking away’ from a set** and **counting back**. They will develop ways of recording calculations using pictures etc.  Three tigers take away two tigers leaves one tiger.    1 2 3 4 5 6 7 8 9 10  count back on a number line to take away  Children will be introduced to finding the difference by counting on using practical methods and images. | | Children will use numbered number lines, 100 squares, and practical resources to support calculations and **teachers will demonstrate the use of the number line.**  Children will record their ‘jumps’ back on the top of the number line.  If I take away 4 shells, there are 6 left    1 2 3 4 5 6 7 8 9 10  count back on a number line to take away  Children will be introduced to finding the difference by counting on using practical methods and images.  the difference is...  The difference between 11 and 14 is 3. 14-11=3 11+\*= 14   1. 14 2. 11   0 11 14  **Progress to find the difference by counting up**.  Eg 102-97=5 (the same as 97+\*\*= 102)  Use known number facts and place value.  Eg 97-15= 82 so 15+\*\*is 97.  15 95 97  + 80 +2  Work towards a situation where children are recording less information and counting up. | |
| At each stage, where appropriate, children will: | | * Subtract several numbers with different numbers of digits. * Begin to subtract two or more amounts of money, with or without adjustment from the pence to the pounds. * Apply to other areas of maths- finding time intervals, weights, lengths etc. * Know that the decimal points should line up under each other, particularly when subtracting mixed amounts, e.g. £3.59-78p * Begin to subtract two or more decimals with up to 3 digits and the same number of decimal places. * Know that decimal points should line up under each other, particularly when subtracting mixed amounts. | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| - | Year 3  (Stage 3: 2a/3b | Year 4  (Stage 4: NC3a/4b) | Year 5/6  (Stage 5: 4a/5) |
| Key  Vocabulary | 10/100, boundary, decrease, inverse, integers. | | |
| Mental  strategies | Recall subtraction facts up to 20. Count backwards in 10’s from any given number. Be able to -9 and -11 from a given number by taking 10 and then compensating. Subtract a 1 digit number from any 2 digit number mentally. Begin to -19/-21 from a given number. Use inverses to find missing whole numbers such as ‘I think of a number, I add 15 to it. The answer is 35, what is my number?’ | Use compensation to subtract numbers mentally e.g. -49 is -50+1. Calculate subtraction complements to 100. Subtract two 2 digit numbers mentally. | Calculate subtraction complements to 1000. Recall decimal complements to 1 using inverse 0.3+ \*=1 |
| Written strategies | **Consolidate ability to find the difference by counting up**.  Eg 102-97=5 (the same as 97+\*\*= 102)  Use known number facts and place value.  Eg 97-15= 82 so 15+\*\*is 97.  15 95 97  + 80 +2  Work towards a situation where children are recording less information and counting up.  **Develop and use written methods to record, support or explain subtraction of two and three digit numbers. complementary addition**.  Children will use a ‘numbered’ number line initially and then progress to a blank one where the jumps are more efficient. They will use mental recall to support e.g. number bonds, to bridge to the next 10.  This method will be used across a range of contents and with decimals in the context of money and beyond. | **For those more able children, with a sound understanding of place value, partitioning and recall of number facts, expanded methods of subtraction will then be developed.**  **Partition numbers into tens and ones, writing one under the other, as in the column method in a number of ways.**  Eg 81= 80+1, 70+11, 60+21 etc.  **Continue to use number lines for subtraction but extend calculations.**  Eg 92-25=67, 754-86=668  **Refine and use efficient methods to subtract 2 digit and 3 digit whole numbers including £ and p.**  Eg 81-57=24  *Partition leading to compact*  70 + 11 7 1  80+1 so 80 becomes 70, 1 becomes 11 81  50+7 11 – 7= 4, 70-50= 20 leading to - 57  20+4 therefore the answer is 24. 24  The expanded ‘partition’ method leads children into the compact method so they understand its structure and efficiency. | **Use efficient written methods to subtract whole and decimal numbers (up to 2 decimal places) and integers.**  **Continue to use number lines to count on for subtraction using knowledge of place value and complementary addition. Extend calculations to include numbers up to 2 decimal places.**  **3.7 4.0 6.0\_\_6.2**  +0.3 +2 +0.1=2.4  **Consolidation of short method.**  Eg 79.23-64.87  8 . 11 1  79.23  -64.87  14.36  Revert to partitioning if necessary when extending to two decimal places.  79.23= 70+9 + 0.2 + 0.03 |
| At each stage, where appropriate, children will: | * Subtract several numbers with different numbers of digits. * Begin to subtract two or more amounts of money, with or without adjustment from the pence to the pounds. * Apply to other areas of maths- finding time intervals, weights, lengths etc. * Know that the decimal points should line up under each other, particularly when subtracting mixed amounts, e.g. £3.59-78p * Begin to subtract two or more decimals with up to 3 digits and the same number of decimal places. * Know that decimal points should line up under each other, particularly when subtracting mixed amounts. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| X | Foundation 2  (EYFS/NC 1c) | Year 1/2  (Stage 1: NC 1b/2c) | Year 2/3  (Stage 2: NC 2b/3c) |
| Key  Vocabulary | Pair, double, group, set, count out. | + near double. | + lots of, groups of, times, multiply, multiple of, repeated, addition, array. |
| Mental  strategies | To know doubles to 5x2 using fingers to support. Count in 2, 5, 10 by chanting number rhymes etc. | Know doubles to 10x10 and rapidly recall them. | Rapid recall of doubles to 10x10 and other significant doubles, including doubles of multiples of 10, e.g. double 50p = £1.00. Recall multiplication facts for 3 and 4 multiplication tables. Know facts for 2, 5, 10 times multiplication table and can count on and back in these multiples from a given number. Reinforce times tables from this point. |
| Written strategies | Children will experience equal groups of objects and will count in 2’s and 10’s and begin to count in 5’s. They will work on practical problem solving activities involving equal sets or groups. Models and images will be used by the teacher to represent what is happening (as outlined in the EYFS). | Children will develop their understanding of multiplication and use jottings to support calculation:  5+5+5= 3 lots of 5 = 15  2+2+2+2+2= 5 lots of 2 = 10 represents multiplication  as repeated addition. | Children will develop their use of number lines or apparatus to support their understanding.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  0 6 12 18 24  +6 +6 +6 +6  **Arrays**  Children will be able to model a multiplication calculation using an array.  9 9  4 4    3 times 5 is 5+5+5=15 or 3 lots of 5 or 3x5  The representation of multiplication as an array along with the number line will be used to link the mental strategies children are using through counting to the written calculation.  2 x5=10 2+2+2+2+2=5 represents multiplication  as repeated addition.  Draw sets of:  3x2  **Symbols**  Children will understand how symbols stand for known numbers to complete equations using inverse operations.  x5=20 3x =18 x =32 |
| At each stage, where appropriate, children will: | * Use and apply skills learned in a variety of situations, eg role play purchase of 3 apples each one costs 2p. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| X | Year 3/4  (Stage 3: 3b/4c) | Year 4/5  (Stage 4: NC 4c /4b)) | Year 5/6  (Stage 5: 4a/5) |
| Key  Vocabulary | + multiplication, product, times, times as... , factor | | |
| Mental  strategies | Use inverse to find missing whole numbers such as ‘I think of a numbed, double it and add 5. The answer is 35. What is my number? Recall multiplication facts for 6 and 7 tables and corresponding division facts. Begin to recall 8 and 9 times tables. Can multiply by 10. | Can multiply by 10/100. Recall multiplication facts up to x10. Use their knowledge of multiplication tables and place value calculations with multiples of 10 such as 30x7. Begin to recall some square numbers. use related facts of doubling e.g. find the x24 table by doubling the x12. | |
| Written strategies | Children will learn how to use arrays, where appropriate, leading into the grid method. They will use apparatus to support this transition if necessary.  10 3  40 12  4  40 +12=52  **Have thorough knowledge of 2,3,4,5 and 6 multiplication tables.**  **Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect**  7 x 10 = 70; 18 x 100 = 1800  **Use practical and informal written methods to multiply two-digit numbers by 2, 3, 4, 5 and 6 (e.g. 13 3).**  **Partitioning:**  13 x 3=  (10 x 3) + (3 x 3) = 30 + 9 = 39  **Grid Method:**  38 x 4=   |  |  |  | | --- | --- | --- | | X | 30 | 8 | | 4 | 120 | 32 |   120 + 32 = 152  **Understand multiplication is the inverse of division. Use this to derive and record related multiplication and division number sentences**  3 x 5 = 15. What else do I know? | **Develop and use written methods to record, support and explain multiplication of two-digit numbers by one-digit numbers (now including 7, 8 and 9)**  **Partitioning:**  15 x 9  (10 x 9) + (5 x 9) = 90 + 45 = 135  **Grid Method:**  38 x 7   |  |  |  | | --- | --- | --- | | X | 30 | 8 | | 7 | 210 | 56 |     210 + 56 = 266  **Multiply single digits by 10 and 100**  **Multiply two multiples of 10**  **Multiply numbers such as 0.2, 0.3, 0.4 etc by a single digit**  **Refine and use efficient written methods:**  **HTU U, TU TU, U.t U**  **Extend grid method to carry out calculations such as 135 x 8, 56 x 27, 3.8 x 6**   |  |  |  |  | | --- | --- | --- | --- | | X | 100 | 30 | 5 | | 8 | 800 | 240 | 40 |      |  |  |  | | --- | --- | --- | | x | 50 | 6 | | 20 | 1000 | 120 | | 7 | 350 | 42 |  |  |  |  | | --- | --- | --- | | x | 3 | 0.8 | | 6 | 18 | 4.8 |   …then…   |  |  | | --- | --- | | 38 |  | | X 7 |  | | 210 | (30 x 7) | | 56 | (8 x 7) | | 266 |  | | **Use efficient written methods to multiply integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer**  **Extend calculations to 135 x 87 and 3.65 x 8.**  Use grid method to consolidate understanding if necessary.   |  |  |  |  | | --- | --- | --- | --- | | X | 100 | 30 | 5 | | 80 | 8000 | 2400 | 400 | | 7 | 700 | 210 | 35 |  |  |  |  |  | | --- | --- | --- | --- | | X | 3 | 0.6 | 0.05 | | 8 | 24 | 4.8 | 0.4 |   …then for some children…  Compact Method   |  |  | | --- | --- | | 38 |  | | X 7 |  | | 266 |  | | 5 |  |  |  |  | | --- | --- | | 72 |  | | X 34 |  | | 2100 | 70 x 30 | | 280 | 70 x 4 | | 60 | 2 x 30 | | 8 | 2 x 4 | | 2448 |  |   72  X 34  2160 (72x30)  288 (72x 4)  **2448** |

|  |  |  |  |
| --- | --- | --- | --- |
| ÷ | Foundation 2  (EYFS/NC 1c) | Year 1/2  (Stage 1: NC 1b/2c) | Year 2/3  (Stage 2: NC 2b/3c) |
| Key  Vocabulary | Group, half, share out, count out. | +halfway, between, share. | Share equally, group in... |
| Mental  strategies | Count back in 1’s from any given number up to 10. Begin to count back in 10’s, 2’sw, 5’s using number lines. | Know that halving is a way of undoing doubling with doubles to 5. Confidently count back in 10’s, 2’s, and 5’s from the multiples. | Knowing that halving is a way of undoing doubling with doubles up to 10. Recall division facts for 2, 5 and 10 multiplication tables. Reinforce times tables from this point onwards. |
| Written strategies | In division, children will be introduced to both sharing and grouping through practical play activities. Children will understand equal groups and share items out in play and problem solving. They will count in 2’s and 10’s and later in 5’s. Models and images must be used by the teacher. | Children will use jottings to support practical calculation activities. They will experience division as both grouping and sharing using different models and images to represent their thinking, including links to arrays. | Children will begin to develop their understanding of ‘chunking’ on a number line using repeated addition to add multiples of the divisor. Initially, these should be multiples of 10’s, 5’s and 2’s – numbers with which the children are more familiar.  Teachers will demonstrate the links between multiplication and division to support children in the later stages as they begin to ‘chunk’ on the number line.  There are 6 sweets. How many people can have 2 each? (How many 2’s make 6?)  0 2 4 6  Moving to: 18 divided into groups of 3    0 3 6 9 12 15 18  Share into sets e.g.  6÷2=3  Or |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ÷ | Year 3/4  (Stage 3: 3b/4c) | | Year 4/5  (Stage 4: NC 4c /4b)) | Year 5/6  (Stage 5: 4a/5) |
| Key  Vocabulary | +Divisible by, quotient | +Factor, divisibility | | |
| Mental  strategies | Know that halving is a way of undoing the doubling of any number. Use inverses to find missing whole numbers such as, ‘I think of a number, double it and add 5. The answer is 35. What is my number?’ Beginning to divide by 10. | | Can divide by 10/100. Recall all multiplication facts and corresponding division facts up to x10. Use their knowledge of division facts and place value in calculations with multiples od 10 150÷5=30. Use related facts of halving eg ÷4 by half then again. Begin to use tests of divisibility. | Use tests of divisibility. |
| Written strategies | **Use practical and informal written methods to divide two-digit numbers by 2, 3, 4, 5 and 6. (e.g.50 4);**  **Round remainders up or down, depending on the context**  **Understand that division is the inverse of multiplication; use this to derive and record related multiplication and division number sentences**  Understand division as sharing and grouping:  18 ÷ 3 can be modelled as:  Sharing – 18 shared between 3  Grouping - How many 3’s make 18? Remainders 16 ÷ 3 = 5 r1  Sharing - 16 shared between 3, how many left over?  Grouping – How many 3’s make 16, how many left over?  **Develop and use written methods to record, support and explain division of two-digit numbers by a one-digit number, including remainders (e.g. 98 6)**  **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  Partitioning into multiples of the divisor:  e.g 72 = 50 + 22  72  50 + 22  10 + 4 r2  50 ÷ 5 = 10  22 ÷ 5 = 4r2  = 10 + 4r2 = 14 r 2  72  - 50 (10 groups)  22  - 20 (4 groups)  Answer : 14 remainder 2 | | **Develop and use written methods to record, support and explain division of three-digit numbers by a one-digit number, including remainders (e.g. 198 6)** Remainders Quotients expressed as fractions or decimal fractions  61 ÷ 4 = 15 ¼ or 15.25  **Pencil and paper procedures**  256 ÷ 7 lies between 210 ÷ 7 = 30 and 280 ÷ 7 = 40 CHUNK  Partitioning into multiples of the divisor:  e.g. 256 = 210 + 46  210 ÷ 7 = 30  46 ÷ 7 = 6r4  = 30 + 6r4 = 36r4  256  - 210 (30 groups of 7) (30x7)  46  - 42 (6 groups of 7) (6x7)  4  Answer: 36 remainder 4  256=   1. + 46 SHORT DIVISION   30 + 6r4 = | Use efficient written methods to divide integers and decimals by a one-digit integer.  **Sharing and grouping**  Continue to understand division as both sharing and grouping (repeated subtraction). Remainders Quotients expressed as fractions or decimal fractions  676 ÷ 8 = 84.5  USE OF DECOMPSOITION IS VITAL.    **Pencil and paper procedures**  977 ÷ 36 is approximately 1000 ÷ 40 = 25  Partitioning into multiples of the divisor:  e.g. 977 = 720 + 180 + 77  720 ÷ 36 = 20 so 20 groups of 36=720  180 ÷ 36 = 5  77 ÷ 36 = 2r5      Of 36  Of 36  Of 36    Chunk for 2 digit long division. |