

**Covingham Park Primary School**

**Progression in Calculations Policy**

Our vision is to provide every child with an outstanding start to their education, which equips them with the necessary skills to meet future changes and challenges throughout their life.

**Date Written: September 2017**

**Author: Amber Jayne Gunning (Maths Leader)**

**Review Date: October 2018**

Our aim is to provide children with accurate, efficient and appropriate methods for calculating; this policy outlines the progression in the 4 operations of addition, subtraction, multiplication and division. This policy should be used in conjunction with the National Curriculum for Maths and Covingham Park Maths Curriculum.

This policy should be used as a guide to progression and expectations. Some children will progress more quickly; others may need more time to consolidate a particular stage or stages.

If children have their own methods for calculating which are accurate, efficient and appropriate; these should be recognised and continued.

**Calculation Policy: End of Year expectations and ‘journey’ towards these.**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | FS2 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Number facts |  | Vocabulary, counting up and down, identifying and number recognition, ordering, one more and one less,  Secure in recalling and identifying numbers to 20  Doubling | Number facts to 20  Counting on and back from any number up to 100 | x 2, x 5, x 10 tables  Counting on and back in 2’s, 3’s, 5’s and 10’s  Odd/even  Use known number facts e.g. 3 + 10 to calculate 30 + 70 | x 3, x 4, x 8 tables  Doubling and halving | x 6, x 7, x 9, 11, 12  Recall multiplication and inverse division facts for tables up to 12 x 12  Counting on and back through 0 including negative numbers | Prime numbers to 100  Multiples, factors and prime factors  Consolidate multiplication and inverse division facts for tables up to 12 x 12  count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 | Common factors and multiples  Squares and cubes |
| Addition and subtraction | Mental | Add and subtract single digit numbers using equipment. | Secure in adding and subtracting one and two digit numbers to 20.  E.g. 9 + 8; 17 – 8  9 + 🗆 = 15  Use of practical equipment to support mental calculations: number lines, Numicon, 100 squares, bead strings, counters, , Dienes etc. | Use of practical equipment to support mental calculations: number lines, 100 squares, bead strings, Dienes etc.  Consolidate addition and subtraction facts to 20.  Commutativity e.g  5 + 2 + 1 = 1 + 5 + 2 =  1 + 2 + 5 etc | Add and subtract 3 digit number and 1 digit, 10s, 100s:  432 +/- 7  432 +/- 20  432 +/- 100  Mentally (with jottings) e.g. 46 + 78  10/100 more or less from any given number up to 1,000  Use of number lines to calculate time – duration | Continue to practise from Year 3  10/100/1000 more or less from any given number up to 10,000  Use of number lines to calculate time - duration | Add and subtract large numbers mentally  e.g.:  12 462 – 2300  Use of number lines to calculate time - duration | Continue to add and subtract large numbers mentally  Use of number lines to calculate time – duration and negative and positive integers |
| Written | **ADDITION**  43 + 36  40 + 3 30 + 6  40 + 30 = 70  3 + 6 = 9 79  40 + 3  +30 + 6  70 + 9 79  **SUBTRACTION**  46 – 32  46 – 2 = 44  44 – 30 = 14  46 – 39  46 – 9 = 37  37 – 30 = 7  N.B. Always start with ones to embed understanding when using formal written method in later years | **ADDITION**  245 + 496  200 +40 + 5  +400 + 90 + 6  700 + 40 + 1  100 10  245 Begin with  +496 no crossing  741 boundaries,  1 1 extend to  crossing 10s  **SUBTRACTION**  723 – 458 = 265  500 110  ~~700~~ ~~20~~ 13  - 400 50 8  200 60 5  Extend to: | **ADDITION**  2734  +3496  6230  111    **SUBTRACTION**  Extend on compact method from Y3 extending to 4 digits +  1 10 13  7 ~~2 1 3~~  -1 1 49  6 0 6 4    N.B. A small minority may begin the year using expanded method. Need to be proficient in compact method by the end of the year. | **ADDITION AND**  **SUBTRACTION**  Add and subtract numbers with more than 4 digits, including decimals using the compact method. | **ADDITION AND**  **SUBTRACTION**  Continue to add and subtract numbers with more than 4 digits, including decimals using the compact method. |
| Multiplication and division | Mental | Counting in 2s and 10s  Sharing | Counting in 2s, 5s and 10s  **MULTIPLICATION AND DIVISION**  One step problems involving multiplication and division.  Concrete objects, pictorial representations and arrays with the support of the teacher | Multiplication in any order:  2 x 5 = 10  5 x 2 = 10  Arrays, repeated addition number lines used to support learning  And the division inverse 10 ÷ 2 = 5 etc | Using known number facts, e.g,  If 3 x 2 = 6,  30 x 2 = 60  If 6 ÷ 2 = 3  60 ÷ 2 = 30  24 x 3  20 x 3 = 60  4 x 3 = 12  60 + 12 = 72 | Using known number facts to multiply multiples of ten and use the inverse to divide, e.g,  200 x 3 = 600  600 ÷ 3 = 200  Use factor pairs and commutativity, multiplying 3 single digit numbers e,g:  3 x 15 = 3 x 3 x 5  = 9 x 5 = 45 | x and ÷ by 10, 100, 1000  short division beyond times tables with remainders | Mixed operations with large numbers. |
| Written | **MULTIPLICATION**  Arrays  3 x 5; 5 x 3    Number tracks / Number line (modelled using bead strings, counting sticks etc)  Repeated addition  Partitioning:  12 x 5  10 + 2  10 x 5 = 50  2 x 5 = 10  50 + 10 = 60  **DIVISION**  Sharing using hoops, pictorial representation, arrays, number lines - repeated subtraction, inverse of x, grouping using objects/resources  Using known multiplication facts (inverse) | **MULTIPLICATION**  Grid   |  |  |  | | --- | --- | --- | | x | 70 | 4 | | 6 | 420 | 24 |   420  + 24  444  **DIVISION**  Number line to model and calculate through repeated subtraction.  21 r2  4 ``/ 86  \_ 40 (x 10)  46  \_ 40 (x 10)  6  \_ 4 x (1)  2 | **MULTIPLICATION**  274 x 6  Begin with grid, extend to expanded method then to compact   |  |  |  |  | | --- | --- | --- | --- | | x | 200 | 70 | 4 | | 6 | 1200 | 420 | 24 |   1200  420  + 24  1644  274  X 6  24 (4 x 6)  420 (70 x 6)  1200 (200 x 6)  1644  274 Begin with  x 6 2 x 1 digit  1644 extend to  42 3 x 1 digit  **DIVISION**  346 ÷ 8 Begin with 2 digit ÷1 digit then extend to 3 digit ÷1:  43 r2  8/346  - 80 (x 10)  266   * 80 (x 10)   186   * 80 (x 10)   106   * 80 (x 10)   26   * 24 (x 3)   2  Moving to:  43 r2  8/346  - 320 (x40)  26  - 24 (x3)  2 | **MULTIPLICATION**  Multiply 4 digit by 1 digit number and 2 digit by 2 digit using compact method:    2543  X 6  15258  3 2 1  8 7  X 2 4  3 42 8  1 714 0  21,0 8 8    Grid for decimals  **DIVISION**  Chunking for 3 digit ÷ 2 digits  242 ÷ 16  15 r 2.  16/242   1. (10x)   82   1. (5x)   2    Short method for 4 digit ÷ 1 digit  0 4 3 2 r 6  8/3342622 | **MULTIPLICATION**  Multiply 4 digit by 2 digit compact method, as in year 5, including decimals.  43.6 x 2.85  43.60  X 2.85  2 11 830 0  34284 8 0 0  871 2 0 0 0  12141**.**21 6 0 0  **DIVISION**  Long division expressing remainders as fractions and decimals      Short method for division by 1 digit, expressing remainders as decimals and fractions  C:\Users\agunning\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\FKPFYRK2\image1.JPG |

* For addition and subtraction – columns headed with 100 10 1
* “Carried” digits are to **always** be carried **under** the calculation
* Refer to models and images charts for resources/images to support understanding
* For clarification on methods/progression/expectations – please see maths leader