![CPPS circle logo[1]]()

**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.

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

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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.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 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 20Doubling | Number facts to 20Counting on and back from any number up to 100 | x 2, x 5, x 10 tablesCounting on and back in 2’s, 3’s, 5’s and 10’sOdd/evenUse known number facts e.g. 3 + 10 to calculate 30 + 70 | x 3, x 4, x 8 tablesDoubling and halving | x 6, x 7, x 9, 11, 12Recall multiplication and inverse division facts for tables up to 12 x 12Counting on and back through 0 including negative numbers | Prime numbers to 100Multiples, factors and prime factorsConsolidate multiplication and inverse division facts for tables up to 12 x 12count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 | Common factors and multiplesSquares 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 – 89 + 🗆 = 15Use 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.g5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5 etc | Add and subtract 3 digit number and 1 digit, 10s, 100s:432 +/- 7432 +/- 20432 +/- 100Mentally (with jottings) e.g. 46 + 7810/100 more or less from any given number up to 1,000Use of number lines to calculate time – duration | Continue to practise from Year 310/100/1000 more or less from any given number up to 10,000Use of number lines to calculate time - duration | Add and subtract large numbers mentallye.g.:12 462 – 2300Use of number lines to calculate time - duration | Continue to add and subtract large numbers mentallyUse of number lines to calculate time – duration and negative and positive integers  |
| Written | **ADDITION**  43 + 3640 + 3 30 + 640 + 30 = 70 3 + 6 = 9 79 40 + 3+30 + 6 70 + 9 79**SUBTRACTION**46 – 3246 – 2 = 4444 – 30 = 1446 – 3946 – 9 = 3737 – 30 = 7N.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 5Extend 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 10sSharing | 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 = 105 x 2 = 10Arrays, repeated addition number lines used to support learningAnd the division inverse 10 ÷ 2 = 5 etc | Using known number facts, e.g,If 3 x 2 = 6, 30 x 2 = 60If 6 ÷ 2 = 360 ÷ 2 = 3024 x 320 x 3 = 60 4 x 3 = 1260 + 12 = 72 | Using known number facts to multiply multiples of ten and use the inverse to divide, e.g,200 x 3 = 600600 ÷ 3 = 200Use 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, 1000short division beyond times tables with remainders | Mixed operations with large numbers.  |
| Written | **MULTIPLICATION**Arrays3 x 5; 5 x 3Number tracks / Number line (modelled using bead strings, counting sticks etc)Repeated additionPartitioning: 12 x 510 + 210 x 5 = 50 2 x 5 = 1050 + 10 = 60**DIVISION**Sharing using hoops, pictorial representation, arrays, number lines - repeated subtraction, inverse of x, grouping using objects/resourcesUsing 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 6Begin with grid, extend to expanded method then to compact

|  |  |  |  |
| --- | --- | --- | --- |
| x |  200 |  70 |  4 |
| 6 | 1200 | 420 | 24 |

1200 420+ 241644 274X 6 24 (4 x 6) 420 (70 x 6)1200 (200 x 6)1644 274 Begin with  x 6 2 x 1 digit1644 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)

 2Moving 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 7X 2 4 3 42 81 714 021,0 8 8 Grid for decimals**DIVISION**Chunking for 3 digit ÷ 2 digits242 ÷ 16 15 r 2. 16/242 1. (10x)

 821. (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 012141**.**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