

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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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	Number facts to 20 Counting on and back from any	x 2, x 5, x 10 tables Counting on and back in 2's, 3's, 5's and 10's	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	Prime numbers to 100 Multiples, factors and prime	Common factors and multiples Squares and
		recognition, ordering, one more and one less, Secure in recalling and identifying numbers to 20 Doubling	number up to 100	Odd/even Use known number facts e.g. 3 + 10 to calculate 30 + 70		up to 12 x 12 Counting on and back through 0 including negative numbers	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	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. $9 + 8$; $17 - 8$ $9 + \Box = 15$ 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	ADDITION	ADDITION	ADDITION AND	ADDITION AND
				43 + 36 40 + 3 30 + 6 40 + 30 = 70 3 + 6 = 9 79 40 + 3 +30 + 6 70 + 9 79	245 + 496 200 + 40 + 5 +400 + 90 + 6 700 + 40 + 1 100 10 245 Begin with +496 no crossing 741	2734 <u>+3496</u> <u>6230</u> 111	Add and subtract numbers with more than 4 digits, including decimals using the compact method.	SOBTRACTION Continue to add and subtract numbers with more than 4 digits, including decimals using the compact method.
				SUBTRACTION	boundaries, 11 extend to crossing 10s	SUBTRACTION		
				46 - 2 = 44 44 - 30 = 14	<u>SUBTRACTION</u> 723 – 458 = 265	Extend on compact method from Y3 extending to 4 digits + 1 10 13		
				46 – 39 46 – 9 = 37 37 – 30 = 7	500 110 -700 20 13 - <u>400 50 8</u>	$7\frac{213}{1149}$ <u>6064</u>		
				N.B. Always start with ones to embed understanding when using formal written method in later years	$\begin{array}{r} 200 60 5 \\ \hline \text{Extend to:} \\ \hline \frac{5}{7} \cdot \frac{13}{4} \cdot \frac{11}{4} \\ - \frac{3}{3} \cdot \frac{6}{7} \\ \hline 3 \cdot 7 \cdot 4 \end{array}$	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.		
Multiplication and division	Mental	Counting in 2s and 10s Sharing	Counting in 2s, 5s and 10s	Multiplication in any order: 2 x 5 = 10 5 x 2 = 10 Arrays, repeated addition number lines used to support learning	Using known number facts, e.g, If $3 \times 2 = 6$, $30 \times 2 = 60$ If $6 \div 2 = 3$ $60 \div 2 = 30$	Using known number facts to multiply multiples of ten and use the inverse to divide, e.g, $200 \times 3 = 600$ $600 \div 3 = 200$ Use factor pairs and commutativity, multiplying 3	x and ÷ by 10, 100, 1000 short division beyond times tables with remainders	Mixed operations with large numbers.
				And the division inverse $10 \div 2 = 5$ etc	24×3 $20 \times 3 = 60$ $4 \times 3 = 12$ $60 + 12 = 72$	single digit numbers e,g: $3 \times 15 = 3 \times 3 \times 5$ $= 9 \times 5 = 45$		

Written	MULTIPLICATION	MULTIPLICATION	MULTIPLICATION	MULTIPLICATION	MULTIPLICATION	MULTIPLICATION
	AND DIVISION	Arrays	Grid	274 x 6	Multiply 4 digit	Multiply 4 digit
	One step			Begin with grid extend to	by 1 digit	by 2 digit
	problems	3 x 5; 5 x 3	x 70 4	expanded method then to	number and 2	compact
	involving		6 420 24	compact	digit by 2 digit	method, as in
	multiplication			x 200 70 4	using compact	year 5, including
	and division.		420	$\frac{1}{6}$ 1200 420 24	method:	decimals.
			<u>+ 24</u>			12 6 4 2 95
	Concrete objects,	Number tracks / Number	444	1200	2543	43.0 X 2.65
	pictorial	line (modelled using bead		420	<u>X 6</u>	43.60
	representations	strings, counting sticks		<u>+ 24</u>	<u>15258</u>	<u>X 2.85</u>
	and arrays with	etc)		<u>1644</u>	321	2 1 ₁ 8 ₃ 0 0
	the support of	Repeated addition				34 ₂ 8 ₄ 8 0 0
	the teacher	Partitioning:		274	87	<u>87<u>1</u>2000</u>
		Fartitioning.		<u>X 6</u>	<u>X 24</u>	12,41,21,600
		12 v 5		24 (4 x 6)	3 4 <mark>2</mark> 8	12141021 000
		12 × 3		420 (70 x 6)	<u>17₁40</u>	
		10 + 2		<u>1200 (</u> 200 x 6)	<u>21,088</u>	Long division
		10×2 10 x 5 = 50		1644		expressing
		$2 \times 5 = 10$			Grid for decimals	remainders as
		2 × 3 = 10		274 Begin with		fractions and
		50 + 10 = 60		$\underline{X \ b}$ 2 X 1 digit		decimals
		50 10 00		1044 exterio to		432 ÷ 15 becomes
			<u>DIVISION</u> Number line to	42 3 X 1 digit		28
		DIVISION	model and	DIVISION		1 5 4 3 2
		Sharing using hoops,	calculate through	$\frac{210131010}{346 \div 8}$ Begin with 2 digit $\div 1$		3 0 0
		pictorial	reneated	digit then extend to 3 digit ± 1	Chunking for 2	1 2 0
		representation, arrays,	subtraction	43 r2	digit ± 2 digits	1 2
		number lines -	Subtraction.	8/346		12' = 4
		repeated subtraction,	21 r2	- 80 (x 10)	242 <i>-</i> 16	4
		inverse of x, grouping	4 ``/ 86	266		Answer: 28 5
		using objects/resources	40 (x 10)	- 80 (x 10)	15 r 2.	432 ÷ 15 becomes
			46	186	16/242	
		Using known	40 (x 10)	- 80 (x 10)	160 (10x)	$3 0 \downarrow 1 3 2$
		multiplication facts	6	106	82	$\begin{array}{ccc} 1 & 2 & 0 \\ \hline 1 & 2 & 0 \end{array}$
		(inverse)	<u>4</u> x(1)	- <u>80 (</u> x 10)	80 (5x)	1 2 0
			2	26	2	Short method for
				- <u>24</u> (x 3)		division by 1
				2		digit. expressing
				Moving to:	Short method for	remainders as
				<u>43 r2</u>	4 digit ÷ 1 digit	decimals and
				8/346		fractions
				- <u>320</u> (x40)		

	$\begin{array}{c} 26 \\ - \frac{24}{2} (x3) \\ \end{array} \qquad \qquad$	$5)\frac{0+\frac{3}{5}}{38}$
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- 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