'So in everything, do to others what you would have them do to you.'
Matthew 7:12

Calculation Policy

This policy contains the key written methods of calculation that are to be taught throughout the school. It has been written to ensure consistency and progression throughout the school.

The overall aim is that when children leave primary school they:
• have a secure knowledge of number facts and a good understanding of the four operations;
• make use of diagrams and informal notes to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;
• have an efficient, reliable, formal, written method of calculation for each operation that they can apply with confidence when undertaking calculations that they cannot carry out mentally.

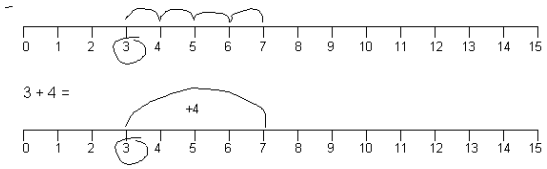
They can select the method by asking themselves:
'Can I do this in my head?'
'Can I do this in my head using drawings or jottings?'
'Do I need to use a written method?'

Although the main focus of this policy is on formal written methods it is important to recognise that the ability to calculate mentally lies at the heart of numeracy as in every written method there is an element of mental processing.

Although each method will be taught in the year group specified, children should not be discouraged from using previously taught methods with which they are secure, while the new concepts are becoming embedded.

Examples of the formal written methods for each of the four operations have been outlined alongside the objective from the National Curriculum.

Addition - Written Calculations

Year 1 Number line	Objective
	Add one-digit and two-digit numbers to 20, including zero
Year 2 Using a blank number line	
Number line 25 + 36 = 61  Partitioning 47+ 52 = 99 40 + 50 = 90 7 + 2 = 9 90 + 9 = 99	Add numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and ones TU + U • a two-digit number and tens TU + T • two two-digit numbers TU +TU • adding three one-digit numbers U + U + U Higher ability children to move to HTU + TU
Year 3 Column addition with carrying (see below *)	
442 + 335 = 777 **HTU** 442 + 335 777 872 + 541 = 1413 **ThHTU** 872 + 541 1413 11	• Add numbers **with up to 3 digits**, using the formal written methods of columnar addition • Estimate the answer to a calculation and use inverse operations to check answers
Year 4 Column addition with carrying (see below *)	
442 + 335 = 777 **HTU** 442 + 335 777 872 + 541 = 1413 **ThHTU** 7872 + 541 8413 1 1	• Add numbers **with up to 4 digits** using the formal written methods of columnar addition where appropriate • Estimate and use inverse operations to check answers to a calculation
Year 5 Column addition (including decimals with up to 2 decimal places)	
7176 + 6147 = 13323 7176 + 6147 13323 4.28 + 7.99 = 12.27 4.28 + 7.99 12.27 11 1	• Add whole numbers with **more than 4 digits**, including using formal written methods (columnar addition) • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Use addition methods in a range of real life and problem based contexts.
Year 6 Column addition (including decimals with up to 3 decimal places)	
7176 + 6147 = 13323 7176 + 6147 13323 4.28 + 7.99 = 12.27 4.28 + 7.99 12.27 11 1	**As above** • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy • Use addition methods in a range of real life and problem based contexts.

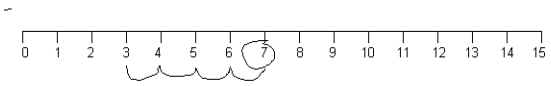
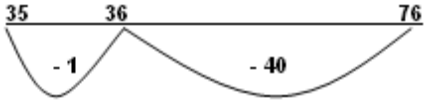
*** Use expanded methods if necessary to support move to formal methods**

47 = 40 + 7
+ 76 70 + 6
110 + 13 = 123

or

47
+ 76
13
110
123

Subtraction - Written Calculations

Year 1 Number line	Objective
7 – 4 =3 Using a number Line: (with divisions):  Later use of blank number lines and later 100 squares	Subtract one-digit and two-digit numbers to 20, including zero TU - U
Year 2 Using a blank number line to count back in multiples of 10 and 1	
76 – 41 =  Partitioning 76 - 41 = 35 76 - 40 = 36 36 - 1 = 35	Subtract numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and ones TU – U • a two-digit number and tens TU – T • two two-digit numbers TU – TU Higher ability to move to HTU – TU
Year 3 Column subtraction (see below *)	
242 – 131 = 111 242 - 131 111 74 – 27 = 47 6 1 74 27 47	• Subtract numbers **with up to 3 digits**, using the formal written methods of columnar subtraction • Estimate the answer to a calculation and use inverse operations to check answers
Year 4 Column subtraction (see below *)	
263 – 271 = 292 5 1 263 - 125 138 3675 – 1234 = 2441 3675 - 1234 2441	• Subtract numbers **with up to 4 digits** using the formal written methods of columnar subtraction where appropriate • Estimate and use inverse operations to check answers to a calculation
Year 5 Column subtraction (including decimals with up to 2 decimal places)	
563 – 271 = 292 4 16 13 563 - 271 292 4.31 – 4.1 = 0.221 4.321 - 4.1 0.221	• Subtract whole numbers **with more than 4 digits**, including using formal written methods (columnar subtraction) • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. • Use subtraction methods in a range of real life and problem based contexts.
Year 6 Column subtraction (including decimals with up to 3 decimal places)	
563 – 278 = 138 4 15 13 563 - 278 292 402.1 – 243.86 = 3 9 11 10 10 402.10 - 243.86 158.24	**As above** • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. • Use addition methods in a range of real life and problem based contexts.

*** Use expanded methods if necessary to support move to formal methods**

77 – 45 = 32

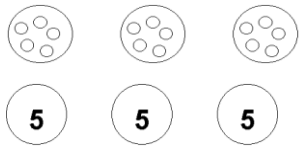
70 + 7
- 40 + 5
30 + 2

and

75 – 27 = 47

60 14
70 + 4
- 20 + 7
40 + 7

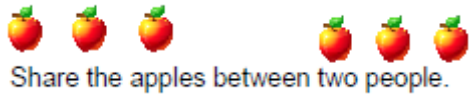
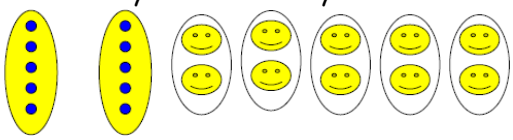
Multiplication - Written Calculations

Year 1 Grouping	Objective
Making sets: e.g. 3 sets / lots of a  leading to 5 5 5	• Solve simple one-step problems involving multiplication, calculating the answer using concrete objects, pictorial representations and arrays • With the support of the teacher count in multiples of twos, fives and tens
Year 2 Grouping/Arrays/Repeated Additio	
Arrays 1 x 12 — 1 row of 12 2 x 6 — 2 rows of 6 3 x 4 — 3 rows of 4  Repeated Addition 4 x 6 = 24 4 + 4 + 4 + 4 + 4 + 4 = 24	• Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs • TU x U or U x TU - Know that it can be done in any order. • Recall 2,5 and 10 times tables
Year 3 Grid method leading to short multiplication (see below *)	
35 x 7 = 245 × | 30 | 5 7 | 210 | 35 210 + 35 = 245 35 x 7 = 245 35 X 7 245 3	Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, progressing to efficient written methods
Year 4 Short multiplication (see below *)	
89 x 7 = 623 89 x 7 623 6 237 x 27 = 948 237 x 4 948 1 2	Multiply two-digit and three-digit numbers by a one-digit number using a formal written layout
Year 5 Short and long multiplication (including decimals in context)	
6481 x 9 = 58329 6 4 8 1 x 9 5 8 3 2 9 4 7 56 x 27 = 1512 56 x 27 392 1120 1512 1	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
Year 6 Long multiplication (including decimals in context)	
134 x 32 = 4288 134 x 32 268 4020 4288 124 x 26 = 3224 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

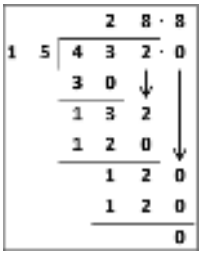
*** Use expanded methods if necessary to support move to formal method**

38
x 7
56 8 x 7 = 56
210 30 x 7 = 210
266

Division - Written Calculations

Year 1 Sharing … leading to … Grouping	Objective
 Share the apples between two people. Share 20 crayons between 2 pots.' ' How many crayons are in each pot?' Children should move from sharing to grouping in a practical a practical way… 'Put 20 crayons into groups of 10. How many pots do we need?' 	Solve simple one-step problems involving division, calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher Use arrays to solve early division  How many groups of two?' 'Five groups of two' How many groups of 5?' 'Two groups of five'
Year 2 Grouping	
Use arrays to support division 15 ÷ 5 = 3 and 15 ÷ 3= 5. Use an empty number line to count forwards or back in equal steps	Calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs
Year 3 Use of inverse operation	
Use of inverse operation to solve division sums. 26÷5=5r1 5 x 5 = 25 25 + 1 = 26	Write and calculate mathematical statements for division using the multiplication tables that they know, progressing to efficient written methods
Year 4 Chunking (including remainders) leading to short division	
72 ÷ 6 = 12 6 | 72 - 60 (10) 12 - 12 (2) Leading to … 1 4 7 | 9 8 (2)	No specific objective for division written methods so … **As above**
Year 5 Short division - dividing by a one digit number (Decimal division in context to be included)	
98 ÷ 7 = 14 1 4 7 | 9 8 (2) 432 ÷ 5 = 86r2 8 6 r 2 5 | 4 3 2 (3)	Divide numbers up to 4 digits by a one-digit number using a formal written method of short division and interpret remainders appropriately for the context
Year 6 Short and Long division - dividing by a two digit number (Decimal division in context to be included)	
432 ÷ 15 = 15 r12 2 8 r 12 1 5 | 4 3 2 3 0 0 1 3 2 1 2 0 1 2 * See below 496 ÷ 11 = 45 r1 4 5 r 1 1 1 | 4 9 6 (5) Answer: $45\frac{1}{11}$	• Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of short division, and interpret remainders according to the context

*** A further method for long division may be used**



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