Temple Ewell Church of England Primary School

Progression towards a standard method of calculation

Agreed February 2026
To be reviewed September 2027

Introduction: The 2014 National Curriculum provides a structured and systematic approach to the teaching of calculation. The aim is for mental calculations and written procedures to be performed efficiently, fluently, accurately with understanding. Procedures and understanding are to be developed in tandem. End of key stage expectations are explicit in the programme of study.

At Temple Ewell CE Primary School, we have a consistent approach to the teaching of written calculation methods in order to ensure continuity and progression across the school.

Age related expectations:

Children are to be taught to age appropriate expectations as set out in the National Curriculum 2014; **however it is vital that pupils are taught according to the stage that they are currently working at.**

Providing a context for calculation:

It is important that any type of calculation is given a real life context or problem solving approach to help build children's understanding of the purpose of calculation, and to help them recognise when to use certain operations and methods. It is also important for children to be confident to use mental and written strategies to explain their thinking. This must be a priority within calculation lessons. Written methods need to be viewed as tools to enable children to solve problems and record their thinking in an organised way.

Aims:

Children should be able to use an efficient method, mental or written appropriate to the given task, with understanding. By the end of year 6, children will have been taught, and be secure with, a compact standard method for each operation.

To develop efficient written calculation strategies children need:

- Secure mental methods which are developed from early years

- A solid understanding of the number system
- Practical hands on experience including a range of manipulatives
- Visual models and images including number lines and arrays
- Experience of expanded methods to develop understanding and avoid rote learning
- Secure understanding of each stage before moving onto the next.

Before carrying out a calculation, children will be encouraged to consider:

- Can I do it in my head? (using rounding, adjustment)
- The size of an approximate answer (estimation)
- Could I use jottings to keep track of the calculation?
- Do I need to use an expanded or compact written method?

Pre requisite skills for written calculations

Addition and subtraction:

- Do they know all the addition and subtraction facts for all numbers to 20?
- Do they understand place value and can they partition and then re-partition numbers?
- Can they add three single digit numbers mentally?
- Can they add and subtract any pair of two digit numbers mentally?
- Can they explain their mental strategies orally and record them using informal jottings?

Multiplication and Division:

- Do they know the 2, 5 and 10 times tables and corresponding division facts?
- Do they know the result of multiplying by 1 and 0?
- Do they understand 0 as a place holder?
- Can they multiply two and three digit numbers by 10 and 100?
- Can they double and halve two digit numbers mentally?
- Can they use multiplication and division facts they know to derive mentally other multiplication and division facts that they do not know?
- Can they explain their mental strategies orally and record them using informal jottings?

These lists are not exhaustive but are a guide for the teacher as they structure the move from informal to formal methods of calculation. It is vitally important that children's mental methods of calculation continued to be practised and secured alongside their learning and use of an efficient written method for each operation.

A pathway to teaching calculation methods:

Expanded methods should be viewed as steps towards a standard method and not as methods in themselves.

Before beginning to record in a more refined written format children must have had significant practical work reinforced with appropriate manipulative, models and images.

Teachers will guide pupils to refine their written methods of recording by modelling and asking questions such as "What is the same? What's different?"

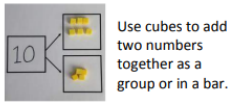
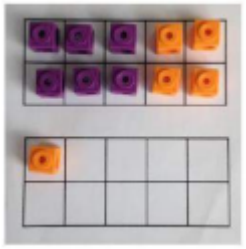
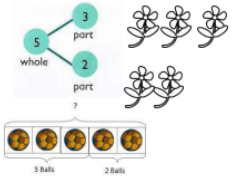
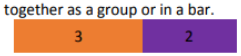
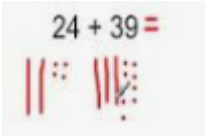
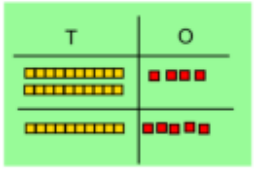
Learning will be planned to ensure pupil are encouraged to use and apply what they have learnt to problem solving tasks.

As children move along the pathway it is **vital that they practice, reinforce, consolidate, use and apply it to mathematical learning** and **NOT** simply move onto the next step.

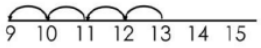
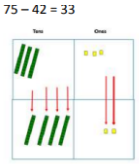
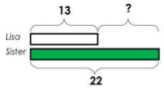
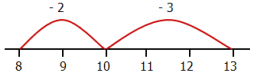
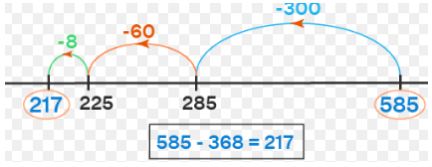
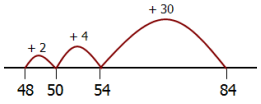
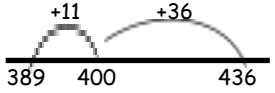
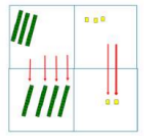
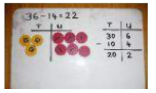
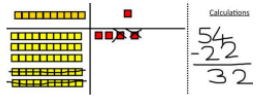
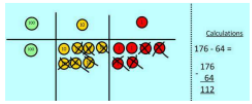
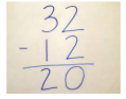
Point to note:

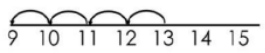
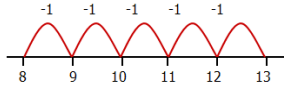
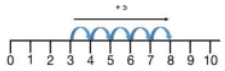
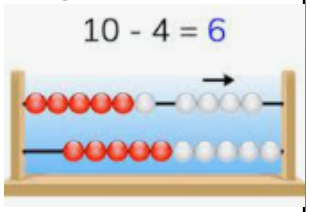
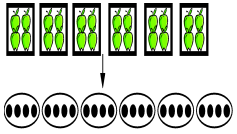
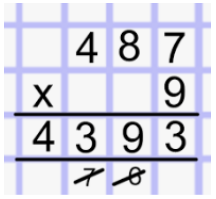
Teachers should refer to the programme of study for key vocabulary for each year group.

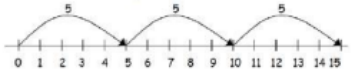
The following pages outline how the progression of calculations to be taught at Temple Ewell. They are organised according to stage, children moving through the stages according to their understanding and age expectation according to the 2014 National Curriculum (teachers are providing with additional guidance to support this). Children are expected to be taught to lay their calculations out as outlined below.

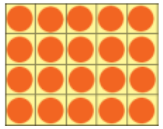
Addition	Using concrete objects 4 + 3 = 7   6 + 5 = 11  Drawing objects and using pictorial representations 3 + 2 = 5  Use pictures to add two numbers together as a group or in a bar.  Counting up in ones on a number line Use a number line to count on in ones.  Use a part, pert whole digram to support thinking	Children will be encouraged to add the ones first to prepare them for later stages of addition and to ensure a consistent approach:  24 + 15 =  	Children are encouraged to add the smaller number to the bigger, adding the ones first This method is used to underpin later mental work Children partition the numbers into ones, tens etc then add the ones first – to continue to support later strategies 47 + 35 = 82 7 + 5 = 12 40 + 30 = 70	Children move to contracted method, adding from the ones first 124 + 34 158	children move to exchanging the ones, striking it out as it is added back in 129 + 34 153 1 Children move to exchanging tens for hundreds 189 + 234 313 1 1	Move to adding decimals 18.9 + 23.4 31.3 1 1

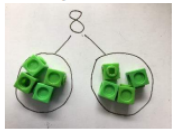
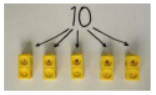
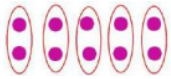
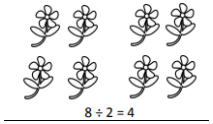
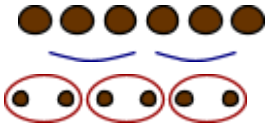
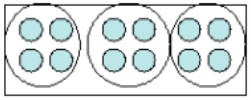
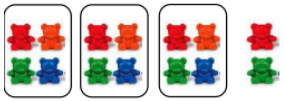
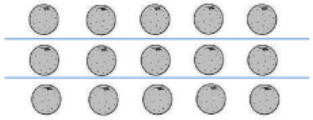
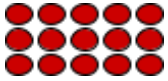
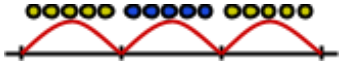
	2 + 3 = 5 3 + 2 = 5 5 = 3 + 2 5 = 2 + 3  Use the part-part-whole diagram as shown above to move into the abstract.					

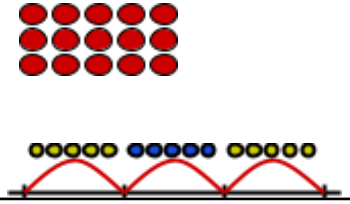
Subtraction	Using concrete objects Use physical objects, counters, cubes etc. to show how objects can be taken away. 4 – 2 = 2  Drawing objects and crossing out those taken away/ subtracted 4 – 2 = 2  Mark making  [Might be recorded as: 9 – 5 = 4] Using a number line Count back on a number line or number track  Start at the bigger number and count back the smaller number, showing the jumps on the number line.	Use manipulatives to support subtraction work, they record their method using jottings to show manipulative - base ten - tens and ones 75 – 42 = 33  Use Base 10 to make the bigger number then take the smaller number away. 86-23=63   Draw bars to find the difference between 2 numbers.	Continue to use base ten to support written calculations Subtract on a number line by counting backwards using efficient jumps 13-5=8  Move to counting back larger numbers, counting back the ones first to support later operations 	Count on to find the difference 84-48=  2+4+30=36 Move to finding the difference between larger numbers 436-389= 47  Children subtract the ones first, they are expected to line the values under each other… 333-212=121 300 +30+3 200+10+2 100+20+1	75 – 42 = 33  Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Again make the larger number first.   Draw the Base 10 or place value counters alongside the written calculation to help to show working.  47–24=23 40+7 –20+4 20+3 This will lead to a clear written column subtraction. 	 Children can start their formal written method by partitioning the number into clear place value columns.  Moving forward the children use a more compact method. Ontracted method, starting from the ones 876-341= 876 -341 531 Moving to exchanging the numbers, using manipulatives as needed 2 7 8 1 4 -1 3 5 1 1 5

	Count back on a number line or number track  Start at the bigger number and count back the smaller number, showing the jumps on the number line.   Count on to find the difference. Using a rekenrek  					Then apply to decimal numbers ensuring that values are lined up and the decimal point is in alignment 72.5 - 45.7 = 26.8 $\begin{array}{r} {}^{6}\not{7}{}^{11}\not{2}.{}^{1}5 \\ -\ 4\ 5.7 \\ \hline 2\ 6.8 \end{array}$ Use decomposition with decimals, striking out the numbers
Mul tipli cati on	Pictures/Symbolic There are four apples in each box. How many apples in six boxes 	   Use different objects to add equal groups.	Use the formal written method $\begin{array}{r} 34 \\ \times\ \ 3 \\ \hline 102 \\ \hline \not{1} \end{array}$	Use the formal written method for increasingly complex numbers  	multiplying a 2 digit number by a 3 digit number $\begin{array}{r} 124 \\ \times\ 26 \\ \hline 744 \\ \not{1}\ \not{2} \\ 2480+ \\ \hline 2224 \\ 1\ \ 1\ \not{} \end{array}$

		There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 + 2 + 2 = 6  5 + 5 + 5 = 15 Write addition sentences to describe objects and pictures.  2 + 2 + 2 = 6 Use arrays  			

		Draw arrays in different rotations to find **commutative** multiplication sentences.  4 × 2 = 8 2 × 4 = 8  2 × 4 = 8 4 × 2 = 8 Link arrays to area of rectangles.  Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15			

Division	Use concrete objects to share (eg between 2 people) 8 ÷ 2 = 4  Use manipulatives Divide quantities into equal groups  	Use pictures to share  Use manipulatives to share Symbolic/ pictures to support work 6 cakes shared between 2  Chunking 6 cakes put into groups of 2   12 shared between 3 people = 4 14 ÷ 3 = Divide objects between groups and see how much is left over 	Link division to multiplication by creating an array and thinking about the number sentences that can be created.  Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15 Use of arrays to support division  Draw an array and use lines to split the array into groups to make multiplication and division sentences. 15 ÷ 5 = 3  	Use known facts to partition numbers to aid division 51 ÷ 3 = 3 x 10 = 30 3 x 7 = 21 51	Use the 'bus stop' method when dividing by a single digit number 14 7 | 98 2 Begin with divisions that divide equally with no remainder. 218 4 | 872 3	Moving to looking at questions with remainders 86 r 2 5 | 432 3	Looking at decimal numbers 14.6 35 | 511.0 16 21 142 ÷ 4 = 35·5 r2 035·5 4 | 142·0 2/4 =1/2 = 0.5 0763 4 | 3052 3052 ÷ 4 = 763

					36 x 4 144 2		
							

Fractions

COUNTING IN FRACTIONAL STEPS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	count on or back in in $\frac{1}{2}$ or $\frac{1}{4}$ to 10,	*Count on and back in $\frac{1}{2}$, $\frac{1}{4}$ and 1/3* count up and down in tenths	*Count on or back in unit fractions* count up and down in hundredths	*Count on or back in mixed number steps such as 11/4*	*Count on or back in tenths, hundredths and thousandths*
RECOGNISING FRACTIONS					
recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	*Recognize find and write fractions of a set of objects, shapes or quantities including those with a range of numerators and denominators* recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	*Recognise mixed numbers and improper fractions and convert from one to the other* recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	*Continue to recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents*

COMPARING FRACTIONS					
		compare and order unit fractions, and fractions with the same denominators , *including on a number line*	Continue to compare and order unit fractions, and fractions with the same denominators , *including on a number line*	compare and order fractions whose denominators are all multiples of the same number *including on a number line .*	compare and order fractions, including fractions *>1 e.g. 2,2 3/4 , 1 3/4, 1 ½ and position them on a numbers line*

EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)					
Find fractions of small numbers or quantities practically and describe orally	write simple fractions e.g. $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$.	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$)	use common factors to simplify fractions; use common multiples to express fractions in the same denomination associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)
		recognise and write decimal equivalents of any number of tenths	recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to $^1/_4$; $^1/_2$; $^3/_4$	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction	*Find simple percentages of amounts* recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

ADDITION AND SUBTRACTION OF FRACTIONS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

		add and subtract fractions with the same denominator within one whole *using diagrams* (e.g. $^5/_7 + {}^1/_7 = {}^6/_7$)	add and subtract fractions with the same denominator *using diagrams*	add and subtract fractions with the same denominator and multiples of the same number *using diagrams* recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $^2/_5 + {}^4/_5 = {}^6/_5 = 1^1/_5$)	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
MULTIPLICATION AND DIVISION OF FRACTIONS					
				multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form *using diagrams* (e.g. $^1/_4 \times {}^1/_2 = {}^1/_8$) multiply one-digit numbers with up to two decimal places by whole numbers
					divide proper fractions by whole numbers (e.g. $^1/_3 \div 2 = {}^1/_6$)
MULTIPLICATION AND DIVISION OF DECIMALS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

			find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	*Continue to find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths*	multiply one-digit numbers with up to two decimal places by whole numbers multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$) use written division methods in cases where the answer has up to two decimal places