



St. Edmund's Catholic Primary School

'Together we learn and grow through worship and celebration'

Calculation Policy

Committee responsible for policy	Curriculum and Achievement
Coordinator	Emily Cheatham
Statutory/Non-statutory	Non STATUTORY
Frequency of Review	Free to determine – every 3 years or earlier if required
Date of last review Approved by Staff/ SLT/Committee/FGB	November 2021
Date of next review	November 2024
Purpose of policy	To understand the teaching requirements for mathematics at St Edmund's school
Consultation	Staff
Links to other policies	All other subject policies Curriculum, Marking, Planning

Introduction

Children are introduced to the processes of calculation through practical, oral and mental activities. As they begin to understand the underlying ideas, they develop ways of recording to support their thinking and calculation methods, use particular methods that apply to special cases, and learn to interpret and use the signs and symbols involved. Over time children learn how to use models and images, such as empty number lines, to support their mental and informal written methods of calculation.

The overall aim is that when children leave primary school they:

- have a secure knowledge of number facts
- recall key number facts instantly
- have a good understanding of the four operations
- are able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies when using one-digit and two-digit numbers and particular strategies to special cases involving bigger numbers
- 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, compact written method of calculation for each operation that children can apply with confidence when undertaking calculations that they cannot carry out mentally

Children should be encouraged to approximate their answers before calculating.

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.

Teaching Mathematics at St Edmund's

In our reception class, children work towards the Early Learning Goals for Number and Shape, Space and Measure. Teaching adopts the Teaching for Mastery principles where appropriate and builds this into the unique pedagogy for the EYFS.

The Key Stage One and Key Stage Two curriculum focuses on four areas: number, measurement, geometry and statistics across the year. Within these areas, concepts are taught slowly and at great depth to ensure the learning is secure and sustainable. Topics are taught in a structured order to ensure learning is built on prior learning and to ensure connections are created between the topics. Included in every lesson are fluency, reasoning and problem-solving tasks, giving the children the opportunity to explore the concept being taught extensively before moving on to the next. Questions are designed carefully by the teachers to provide intelligent practice, developing and embedding conceptual fluency. We believe in exposing the children to multiple representations of a concept, using concrete, pictorial and abstract examples simultaneously to support the children's understanding.

At St Edmund's, we place high importance on mathematical talk. As a result, lessons include regular opportunities for the children to discuss their understanding and explain their thinking, both with the adults and their peers. Accurate use of vocabulary and terminology features prominently in our lessons, with teachers both modelling and expecting it from the children. We believe this will support our children when faced with a range of mathematical problems.

Remember:

Every day is a mental mathematics day – ensure that children engage in sustained mental work each day to secure and develop knowledge, skills and understanding in mathematics. *Don't expect confidence in working mentally if practice, rehearsal and reasoning have not taken place.*

Hands-on learning is important – provide appropriate practical equipment for children to use and manipulate, to expose the mathematical concept being taught, and to help the child to explore how and why things work and to learn to visualise, describe and represent what is in front of them. Where possible, these should be linked to real life application. *Don't just talk about weighing scales, use one; using apparatus is better than imagining how it works.*

Seeing mathematics through models and images supports learning – help children to see how mathematics works and can be represented through multiple representations including physical objects, pictures, or diagrams such as place-value cards, number sticks, number lines, representations of fractional parts. These should also include non-examples to ensure understanding and to reduce misconceptions. *Don't expect children to visualise and 'see' how something works if they have no models and images to draw from.*

Talking mathematics clarifies and refines thinking – give children the vocabulary and language of mathematics; provide activities and time for them to discuss mathematics, using this language. Teach children the precision of language, for example, using: prism, equals, factor and how to express their reasoning using language such as: if... then... because, cannot be, never, sometimes, always. *Don't expect children to explain or provide reasons if they have no opportunity to use, develop and refine the language to do so.*

Learning from mistakes should build up children's confidence – look out for mistakes and encourage children to recognise that making mistakes is something everyone does. Show children common errors and get them to identify and correct them. Encourage children to work with a partner and share their work. *Don't just tell children something is wrong; help them to see what went right and to identify when it went wrong.*

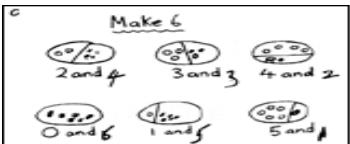

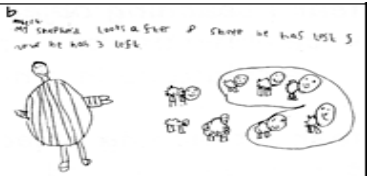
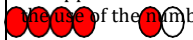
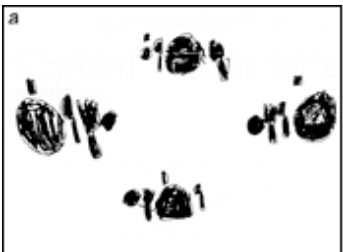
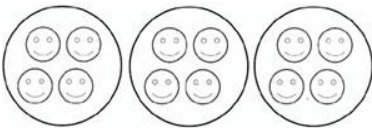

Mental calculation strategies for adding whole numbers	Mental calculation strategies for subtracting whole numbers
<ul style="list-style-type: none"> Counting on in ones and then 10, 5 and 2 using a number line and without Count on from the largest number ('put the number in your head...') Addition facts for all pairs of numbers with a total of up to at least 5 and corresponding subtraction facts Know by heart all pairs/number bonds of numbers with a total of 10 Doubles of numbers to at least 5 Identify near doubles, using doubles already known ($5 + 6$) Begin to bridge 10 when adding a single-digit number Know by heart all pairs/number bonds of numbers with a total of 20 Know by heart all pairs/number bonds of multiples of ten with a total of 100 Know all addition facts for all numbers up to 10 Doubles of numbers to at least 10 and multiples of 10 to 100 Identify near doubles, using doubles already known ($40 + 41$) Derive quickly all pairs of multiples of 5 with a total of 100 Partition any number in a variety of ways, including but not exclusively into tens and ones, then recombine Doubles of all whole numbers to at least 20 Doubles of multiples of 5 to 100 Doubles of multiples of 50 to 500 Identify near doubles, using doubles already known ($80 + 79$) Bridge through a multiple of 10 and adjust Add 2-digit and larger numbers using partitioning into tens and ones, adding tens first Identify near doubles using doubles already known ($150 + 160$) 	<ul style="list-style-type: none"> Counting back in ones and then 10, 5 and 2 using a number line and without, from a multiple of 1, 10, 5 or 2 Know by heart all pairs of numbers with a total of 5 and corresponding subtraction facts Know addition facts for all pairs of numbers to 10 and corresponding subtraction facts Partition any number in a variety of ways, including but not exclusively into tens and ones, then recombine Use known number facts and place value to subtract mentally Find a difference by counting up from the smaller number Count back in repeated steps of 1, 10, 100 Subtract 2-digit numbers using partitioning into tens and ones, subtracting tens first

Mental calculation strategies for multiplying of whole numbers	Mental calculation strategies for dividing whole numbers
<ul style="list-style-type: none"> Derive quickly: <ul style="list-style-type: none"> Year 1 - doubles of numbers to at least 5 Year 2 - doubles of numbers to 10 and multiples of 10 Year 3 – use doubling starting from known facts e.g. double any two-digit number by doubling tens first Know by heart: <ul style="list-style-type: none"> Year 2 - multiplication facts for 2, 5 and 10-times tables Year 3 - multiplication facts for 2, 3, 4, 5, 8 and 10-times tables Year 4 - all multiplication facts to 12 x 12 Derive multiplication facts from known facts e.g.: <ul style="list-style-type: none"> To multiply by 4, double and double again To multiply by 5, multiply by ten and halve To multiply by 20, multiply by 10 and double Multiply by 25 by x 100 and finding a quarter Find x 16 facts by doubling x 8 Find x 12 facts by x10 + x2 Find x 17 facts by x10 + x7 Find sixths by halving thirds Use closely related facts e.g. x 19 by x 20 and adjust To multiply by 10/100/1000, shift the digits one/two/three places to the left (including those with decimals) Use factors e.g. $8 \times 12 = 8 \times 4 \times 3$ and recognise factor pairs Use partitioning to multiply numbers to 20 by a one-digit number Use and understand relationship between multiplication and division Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers 	<ul style="list-style-type: none"> Derive quickly: <ul style="list-style-type: none"> Year 1 - doubles of numbers to at least 5 and corresponding halves Year 2 - doubles of numbers to 10 and multiples of 10 and corresponding halves Year 3 – 6; use halving/doubling starting from known facts e.g. double/halve any two-digit number by doubling/halving tens first Know by heart: <ul style="list-style-type: none"> Year 2 - multiplication facts for 2, 5 and 10- times tables and corresponding division facts Year 3 - multiplication facts for 2, 3, 4, 5, 8 and 10-times tables and corresponding division facts Year 4 - all multiplication facts to 12 x 12 and corresponding division facts Use known facts and place value to multiply and divide mentally, e.g.: <ul style="list-style-type: none"> To divide by 4, halve and halve again (and for finding $\frac{1}{4}$) To divide by 5, divide by ten and double (and to $\frac{1}{5}$) To divide by 20, divide by 10 and halve To divide by 10/100/1000, shift the digits one/two/three places to the left (including those with decimals) Understand that division can result in remainders and can be expressed in different forms

Written methods

Our aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use an efficient written method accurately and with confidence. Children are entitled to be taught and to acquire secure mental methods of calculation and one efficient written method of calculation for each of the four operations (addition, subtraction, multiplication and division), which they know they can rely on when mental methods are not appropriate.

The tables below set out the *expected* models and images, and informal and formal methods of calculation for teachers to use, model and demonstrate to pupils at each stage of learning:

	Addition	Subtraction	Multiplication	Division
Reception	<p>Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures, etc.</p>  <p>Bead strings or bead bars can be used to illustrate addition</p> <p>$8 + 2 = 10$</p> <p>They use number lines and practical resources to support calculation and teachers <i>demonstrate</i> the use of the number line.</p>  <p>$2 + 5 = 7$ 2 count on 5</p> <p>$5 + 2 = 7$ 5 count on 2</p>	<p>Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures etc.</p>  <p>Bead strings or bead bars can be used to illustrate subtraction including bridging through ten by counting back 3 then counting back 2.</p> <p>_____ $6 - 2 = 4$</p> <p>They use number lines and practical resources to support calculation. Teachers <i>demonstrate</i> the use of the number line.</p> 	<p>Children will experience equal groups of objects.</p> <p>They will count in 2s and 10s and begin to count in 5s.</p> <p>They will work on practical problem-solving activities involving equal sets or groups. e.g. laying the table for the 3 bears and goldilocks</p> 	<p>Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.</p>  <p>Count in 2's to find out how many socks are on the washing line:</p> 

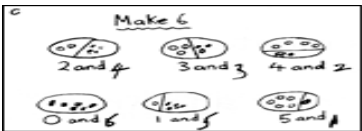


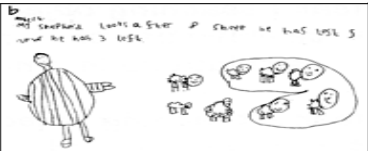
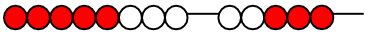
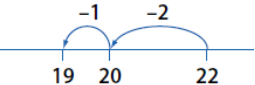
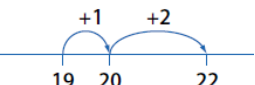

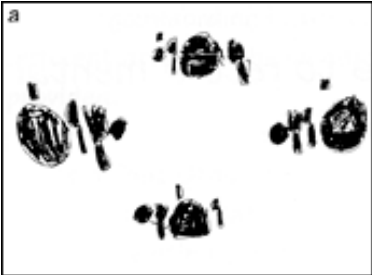
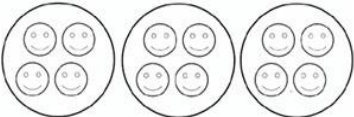

Early Learning Goals – Statutory framework for the early years foundation stage (2021)

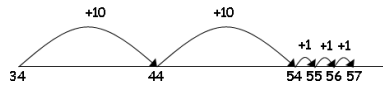
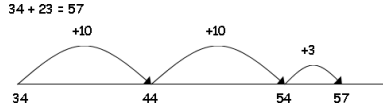

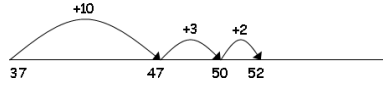
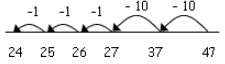
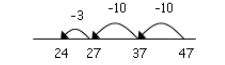
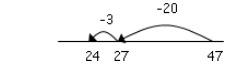
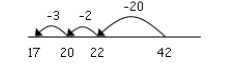
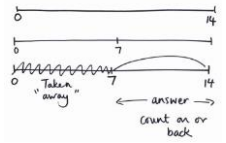
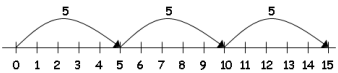
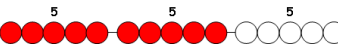
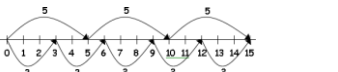
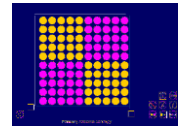
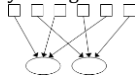

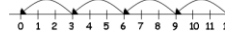
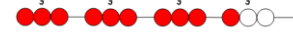
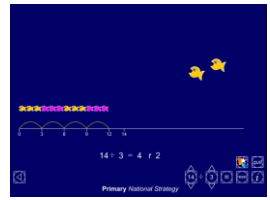
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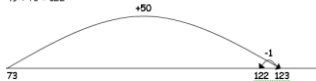
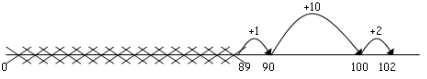

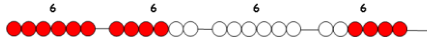
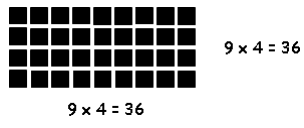

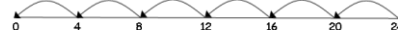
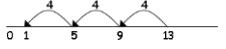
- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts

Numerical patterns:

- Verbally count beyond 20, recognising the pattern of the counting system
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

	Addition	Subtraction	Multiplication	Division
Year 1	<p>Using pictures</p>  <p>Bead strings or bead bars can be used to illustrate addition including bridging through ten by counting on 2 then counting on 3.</p>  <p>They use number lines and practical resources to support calculation and teachers <i>demonstrate</i> the use of the number line.</p> <p>$2 + 5 = 7$ 2 count on 5</p>  <p>$5 + 2 = 7$ 5 count on 2</p> <p>Children then begin to use numbered lines to support their own calculations using a numbered line to count on in ones.</p>	<p>Using pictures</p>  <p>Bead strings or bead bars can be used to illustrate subtraction including bridging through ten by counting back 3 then counting back 2.</p>  <p>$13 - 5 = 8$</p> <p>Children then begin to use numbered lines to support their own calculations - using a numbered line to count back in ones.</p> <p>The number line should also be used to show that $6 - 3$ means the 'difference between 6 and 3' or 'the difference between 3 and 6' and how many jumps they are apart.</p> <p>$22 - 3$</p>  <p>$22 - 19 = 3$</p> 	<p>Children will experience equal groups of objects.</p>  <p>They will count in 2s and 10s and begin to count in 5s.</p> <p>They will work on practical problem-solving activities involving equal sets or groups, e.g. laying the table for the 3 bears and goldilocks</p> 	<p>Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.</p>  <p>Count in 2's to find out how many socks are on the washing line:</p> 
	<p><u>Calculating objectives for Year 1</u> - National Curriculum, 2013</p> <ul style="list-style-type: none"> • read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including zero • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems • Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. 			

	Addition	Subtraction	Multiplication	Division
Year 2	<p>Children will begin to use 'empty number lines' themselves starting with the larger number and counting on.</p> <p>✓ First counting on in tens and ones.</p> <p>$34 + 23 = 57$</p>  <p>✓ Then helping children to become more efficient by adding the ones in one jump (by using the known fact $4 + 3 = 7$).</p> <p>$34 + 23 = 57$</p>  <p>✓ Followed by adding the tens in one jump and the ones in one jump.</p> <p>$34 + 23 = 57$</p>  <p>✓ Bridging through ten can help children become more efficient.</p> <p>$37 + 15 = 52$</p> 	<p>Children will begin to use empty number lines to support calculations.</p> <p>Counting back:</p> <p>✓ First counting back in tens and ones.</p> <p>$47 - 23 = 24$</p>  <p>✓ Then helping children to become more efficient by subtracting the ones in one jump (by using the known fact $7 - 3 = 4$).</p> <p>$47 - 23 = 24$</p>  <p>✓ Subtracting the tens in one jump and the ones in one jump.</p> <p>$47 - 23 = 24$</p>  <p>✓ Bridging through ten can help children become more efficient.</p> <p>$42 - 25 = 17$</p>  <p>Counting on:</p> <p>The number line should still show 0 so children can cross out the section from 0 to the smallest number. They then associate this method with subtracting.</p> <p>$14 - 7 = 7$</p> 	<p>Children will develop their understanding of multiplication and use jottings to support calculation:</p> <p>✓ Repeated addition</p> <p>3 times 5 is $5 + 5 + 5 = 15$ or 3 lots of 5 or 5×3</p> <p>Repeated addition can be shown easily on a number line:</p> <p>$5 \times 3 = 5 + 5 + 5$</p>  <p>and on a bead bar:</p> <p>$5 \times 3 = 5 + 5 + 5$</p>  <p>✓ Commutativity</p> <p>Children should know that 3×5 has the same answer as 5×3. This can also be shown on the number line.</p>  <p>✓ Arrays</p> <p>Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method.</p> <p>$5 \times 3 = 15$</p> <p>$3 \times 5 = 15$</p> 	<p>Children will develop their understanding of division and use jottings to support calculation</p> <p>✓ Sharing equally</p> <p>6 sweets shared between 2 people, how many do they each get?</p>  <p><i>Sharing is covered but the emphasis in Year 2 should be on grouping.</i></p> <p>✓ Grouping or repeated subtraction</p> <p>There are 6 sweets, how many people can have 2 sweets each?</p>  <p>✓ Repeated subtraction using a number line or bead bar</p> <p>$12 \div 3 = 4$</p>   <p>The bead bar will help children with interpreting division calculations such as $10 \div 5$ as how many 5s make 10?</p>  <p>✓ Using symbols to stand for unknown numbers to complete equations using inverse operations</p> <p>$\square \div 2 = 4$ $20 \div \square = 4$ $\square \div \square = 4$</p>
	<p><u>Calculating objectives in Year 2 - National Curriculum, 2013</u></p> <p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p> <p>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) signs</p> <p>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p>			

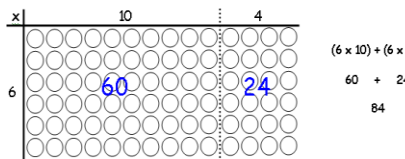
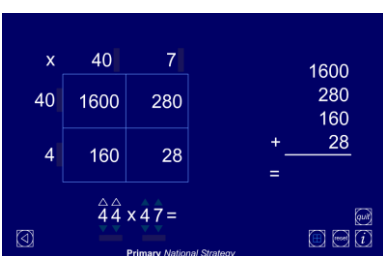
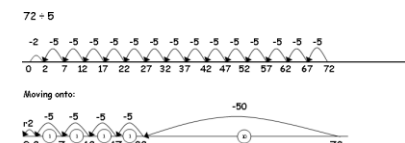
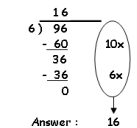
	Addition	Subtraction	Multiplication	Division
Year 3	<p>Children will continue to use empty number lines with increasingly large numbers, including compensation where appropriate.</p> <p>Count on from the largest number irrespective of the order of the calculation.</p>  <p>Compensation</p>  <p>Children will begin to use informal pencil and paper methods (jottings) to support, record and explain partial mental methods building on existing mental strategies.</p> <p>Children will begin to use the expanded column method. They should lay out their calculation so the place value columns are aligned. They will add the smallest place value unit first.</p> $\begin{array}{r} 67 \\ + 24 \\ \hline 11 \text{ (7 + 4)} \\ 80 \text{ (60 + 20)} \\ \hline 91 \end{array}$ $\begin{array}{r} 267 \\ + 85 \\ \hline 12 \text{ (7 + 5)} \\ 140 \text{ (60 + 80)} \\ \hline 200 \\ \hline 352 \end{array}$	<p>Children will continue to use empty number lines with increasingly large numbers.</p> <p>Children will begin to use informal pencil and paper methods (jottings).</p> <p>Partitioning and decomposition</p> <ul style="list-style-type: none"> Partitioning – demonstrated using arrow cards Decomposition - base 10 materials <p>NOTE: When solving the calculation $89 - 57$, children should know that 57 does NOT EXIST AS AN AMOUNT, it is what is being subtracted from the other number. Therefore, children would need to count out only the 89, then 'remove' 57</p> $\begin{array}{r} 89 \\ - 57 \\ \hline 32 \end{array}$ <p>Begin to exchange.</p> $\begin{array}{r} 71 \\ - 46 \\ \hline \end{array}$ <p>Step 1 $\begin{array}{r} 70 \\ - 40 \\ \hline 30 \end{array}$ + 1</p> <p>Step 2 $\begin{array}{r} 60 \\ - 40 \\ \hline 20 \end{array}$ + 11</p> <p>The calculation should be read as e.g. take 6 from 1.</p> <p>This would be recorded by the children as</p> $\begin{array}{r} 80 \\ - 40 \\ \hline 40 \end{array}$ <p>NB: Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc. counting on using a number line should be used.</p> 	<p>Children will continue to use:</p> <p>Repeated addition $4 \text{ times } 6 \text{ is } 6 + 6 + 6 + 6 = 24$ or $4 \text{ lots of } 6 \text{ or } 6 \times 4$ Children should use number lines or bead bars to support their understanding.</p>   <p>Arrays</p> <p>Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method.</p>  <p>Scaling e.g. Find a ribbon that is 4 times as long as the blue ribbon</p>  <p>Using symbols to stand for unknown numbers to complete equations using inverse operations</p> <p>Partitioning</p> $38 \times 5 = (30 \times 5) + (8 \times 5) = 150 + 40 = 190$	<p>Ensure that the emphasis in Y3 is on grouping rather than sharing.</p> <p>Children will continue to use:</p> <p>✓ Repeated subtraction using a number line</p> <p>Children will use an empty number line to support their calculation.</p> $24 \div 4 = 6$  <p>Children should also move onto calculations involving remainders.</p> $13 \div 4 = 3 \text{ r } 1$  <p>✓ Using symbols to stand for unknown numbers to complete equations using inverse operations</p> $26 \div 2 = \square \qquad 24 \div \text{L} = 12$ $\square \div 10 = 8$

Calculating Objectives in Year 3 - National Curriculum, 2013

Add and subtract numbers mentally, including: a three-digit number and one, a three-digit number and tens, a three-digit number and hundreds

Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

	Addition	Subtraction	Multiplication	Division
Year 4	<p>✓ Exchange below the line.</p> $\begin{array}{r} 625 \\ + 48 \\ \hline 673 \\ 1 \end{array} \quad \begin{array}{r} 783 \\ + 42 \\ \hline 825 \\ 1 \end{array} \quad \begin{array}{r} 367 \\ + 85 \\ \hline 452 \\ 11 \end{array}$ <p>Using similar methods, children will:</p> <p>✓ add several numbers with different numbers of digits;</p> <p>✓ begin to add two or more three-digit sums of money, with or without adjustment from the pence to the pounds;</p> <p>✓ know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. £3.59 + 78p.</p>	<p>✓ Partitioning and decomposition</p> $\begin{array}{r} 754 \\ - 86 \\ \hline \end{array}$ <p>Step 1 $700 + 50 + 4$ $- 80 + 6$</p> <p>Step 2 $700 + 40 + 14$ (adjust from T to U) $- 80 + 6$</p> <p>Step 3 $600 + 140 + 14$ (adjust from H to T) $- 80 + 6$ $600 + 60 + 8 = 668$</p> <p>This would be recorded by the children as</p> $\begin{array}{r} 600 + 140 + 14 \\ - 80 + 6 \\ \hline 600 + 60 + 8 = 668 \end{array}$ <p>✓ Decomposition</p> $\begin{array}{r} 6141 \\ 784 \\ - 86 \\ \hline 668 \end{array}$ <p>Children should:</p> <p>✓ be able to subtract numbers with different numbers of digits;</p> <p>✓ using this method, children should also begin to find the difference between two three-digit sums of money, with or without 'adjustment' from the pence to the pounds;</p> <p>✓ know that decimal points should line up under each other.</p> $\begin{array}{r} £8.95 \\ - £4.38 \\ \hline \end{array} = \begin{array}{r} 8 + 0.9 + 0.05 \\ - 4 + 0.3 + 0.08 \\ \hline 8 + 0.8 + 0.15 \\ - 4 + 0.3 + 0.08 \\ \hline 4 + 0.5 + 0.07 \\ \hline = £4.57 \end{array}$ <p>(adjust from T to U)</p>	<p>Children will continue to use arrays where appropriate leading into the grid method of multiplication.</p>  <p>✓ Grid method</p> <p>TO x O (Short multiplication – multiplication by a single digit) 23×8 Children will approximate first 23×8 is approximately $25 \times 8 = 200$</p> $\begin{array}{r} \times 20 \quad 3 \\ 8 \quad 160 \quad 24 \\ \hline 160 \\ + 24 \\ \hline 184 \end{array}$ 	<p>Children will develop their use of repeated subtraction to be able to subtract multiples of the divisor. Initially, these should be multiples of 10s, 5s, 2s and 1s – numbers with which the children are more familiar.</p> $72 \div 5$  <p>Moving onto:</p> <p>Then onto the vertical method: Short division $72 \div 3$</p> $\begin{array}{r} 3 \overline{) 72} \\ - 30 \\ \hline 42 \\ - 30 \\ \hline 12 \\ - 6 \\ \hline 6 \\ - 6 \\ \hline 0 \end{array}$ <p>Answer : 24</p> <p>Leading to subtraction of other multiples.</p> $96 \div 6$  <p>Any remainders should be shown as integers, i.e. 14 remainder 2 or 14 r 2.</p> <p>Children need to be able to decide what to do after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division.</p>

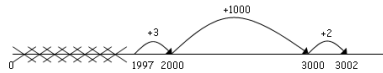
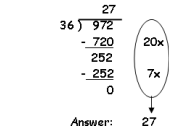
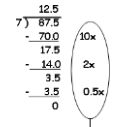
Calculating objectives in Year 4 - National Curriculum, 2013

- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout

	<div>Addition</div> <div>Children should extend the carrying method to numbers with at least four digits.</div> <div><div><div><div>3587</div><div>+ 675</div><div>4262</div><div>111</div></div><div><div>587</div><div>+ 475</div><div>1062</div><div>11</div></div></div></div> <div>Using similar methods, children will:</div> <div><div>✓</div><div>add several numbers with different numbers of digits;</div></div> <div><div>✓</div><div>begin to add two or more decimal fractions with up to three digits and the same number of decimal places;</div></div> <div><div>✓</div><div>know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 3.2 m – 280 cm.</div></div>	<div>Partitioning and decomposition</div> <div><div>Step 1</div><div><div><div>754</div><div>=</div><div>700 + 50 + 4</div><div>- 286</div><div>- 200 + 80 + 6</div></div></div></div> <div><div>Step 2</div><div><div><div>700 + 40 + 14</div><div>- 200 + 80 + 6</div><div>(adjust from T to U)</div></div></div></div> <div><div>Step 3</div><div><div><div>600 + 140 + 14</div><div>- 200 + 80 + 6</div><div>(adjust from H to T)</div><div>400 + 60 + 8 = 468</div></div></div></div> <div>This would be recorded by the children as</div> <div><div><div><div>600</div><div>700</div><div>- 200</div><div>400</div></div><div><div><div>140</div><div>40</div><div>- 80</div><div>60</div></div><div><div>14</div><div>14</div><div>- 6</div><div>8</div></div></div><div>= 468</div></div></div> <div>Decomposition</div> <div><div><div><div>6141</div><div>- 286</div><div>468</div></div></div></div> <div>Children should:</div> <div><div>✓</div><div>be able to subtract numbers with different numbers of digits;</div></div> <div><div>✓</div><div>begin to find the difference between two decimal fractions with up to three digits and the same number of decimal places;</div></div> <div><div>✓</div><div>know that decimal points should line up under each other</div></div> <div>Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc. counting on using a number line should be used.</div> <div><div>1209 – 388 = 821</div><div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div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Calculating Objectives in Year 5 - National Curriculum, 2013

- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- 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
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

	Addition	Subtraction	Multiplication	Division
Year 6	<p>Children should extend the carrying method to number with any number of digits.</p> $\begin{array}{r} 6584 \\ + 5848 \\ \hline 12432 \end{array}$ $\begin{array}{r} 7648 \\ + 1486 \\ \hline 9134 \end{array}$ <p>Most significant quantities should be written first.</p> <p>Using similar methods, children will</p> <ul style="list-style-type: none"> ✓ add several numbers with different numbers of digits; ✓ begin to add two or more decimal fractions with up to four digits and either one or two decimal places; ✓ know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. $401.2 + 26.85 + 0.71$. 	<p>Decomposition</p> $\begin{array}{r} 5131 \\ - 4467 \\ \hline 664 \end{array}$ <p>Children should:</p> <ul style="list-style-type: none"> ✓ be able to subtract numbers with different numbers of digits; ✓ be able to subtract two or more decimal fractions with up to three digits and either one or two decimal places; ✓ know that decimal points should line up under each other. <p>Where the numbers are involved in the calculation are close together or near to multiples of 10, 100 etc. counting on using a number line should be used.</p> <p>$3002 - 1997 = 1005$</p> 	<p>ThHTO x O (Short multiplication – multiplication by a single digit) 4346×8 Children will approximate first 4346×8 is approximately $4346 \times 10 = 43460$</p> $\begin{array}{r} \times 4000 \quad 300 \quad 40 \quad 6 \\ 8 \quad 32000 \quad 2400 \quad 320 \quad 48 \\ \hline 34768 \end{array}$ <p>HTO x TO (Long multiplication – multiplication by more than a single digit) 372×24 Children will approximate first 372×24 is approximately $400 \times 25 = 10000$</p> $\begin{array}{r} \times 300 \quad 70 \quad 2 \\ 20 \quad 6000 \quad 1400 \quad 40 \\ 4 \quad 1200 \quad 280 \quad 8 \\ \hline 8928 \end{array}$ <p>Using similar methods, they will be able to multiply decimals with up to two decimal places by a single digit number and then two digit numbers, approximating first. They should know that the decimal points line up under each other.</p> <p>For example: 4.92×3 Children will approximate first 4.92×3 is approximately $5 \times 3 = 15$</p> $\begin{array}{r} \times 4 \quad 0.9 \quad 0.02 \\ 3 \quad 12 \quad 2.7 \quad 0.06 \\ \hline 12.76 \end{array}$ <p>Alternative method for long multiplication is continued for HTO x TO. Children will first approximate answer. HTO is multiplied by O HTO multiplied by T (0 is added) Total is found</p> $\begin{array}{r} 612 \\ \times 24 \\ \hline 2448 \\ + 12240 \\ \hline 14688 \end{array}$	<p>Children will continue to use written methods to solve short division $T0 \div O$ and $HTO \div O$ moving on to compact method when ready. Extend to decimals with up to one decimal place. Children should know that decimal points line up under each other. Children should make sensible decisions about the interpretation of the remainder.</p> $\begin{array}{r} 19 \\ 5 \overline{)945} \end{array}$ $\begin{array}{r} 23.5 \\ 4 \overline{)94.20} \end{array}$ <p>Long Division Children continue to use written methods to solve $HTO \div TO$ Extend to decimals with up to two decimal places. Children should know that decimal points line up under each other.</p> <p>$972 \div 36$</p>  <p>Answer: 27</p> <p>$87.5 \div 7$</p>  <p>Answer: 12.5</p> <p>Some children will use traditional long division</p> <p>Long division</p> <p>$432 \div 15$ becomes</p> $\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{)432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$ <p>Answer: 28 remainder 12</p> <p>$432 \div 15$ becomes</p> $\begin{array}{r} 28 \\ 15 \overline{)432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$ <p>Answer: $28 \frac{4}{5}$</p> <p>$432 \div 15$ becomes</p> $\begin{array}{r} 28.8 \\ 15 \overline{)432.0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$ <p>Answer: 28.8</p>
	<p>Calculating Objectives in Year 6 - National Curriculum, 2013</p> <ul style="list-style-type: none"> • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • 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 number using the formal written method of short division where appropriate, interpreting remainders according to the context 			