



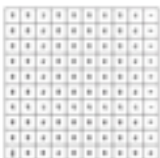





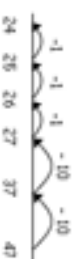





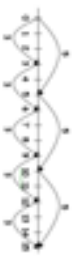







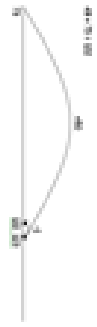

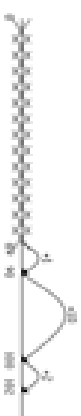
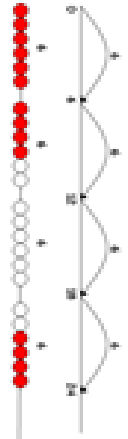

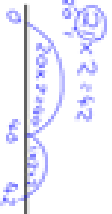

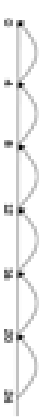


Calculation Policy

Barlby Primary School


We aim for children to learn how to use and apply the four operations (addition, subtraction, multiplication, and division) in abstract maths and real life maths problems. This should be taught through a progressive approach, challenging the children to use an array of strategies. The following is guidance to the strategies that should be learnt by the pupil to ensure progress.

	Addition	Subtraction	Multiplication	Division
Rec	<p>Children's accuracy when counting is consolidated to ensure that they can count reliably with numbers from 1-20 and say which number is one more than a given number. Using quantities and objects, they add two single-digit numbers and count on to find the answer.</p> <p>They use practical resources and a range of different objects and contexts to support addition and teachers demonstrate the use of the number line.</p> <p>They develop ways of recording calculations using pictures, etc. and begin to record their calculations using number sentences.</p> 	<p>Children's accuracy when counting is consolidated to ensure that they can count reliably with numbers from 1-20 and say which number is one less than a given number. Using quantities and objects, they subtract two single-digit numbers and count back to find the answer.</p> <p>They use practical resources and a range of different objects and contexts to support addition and teachers demonstrate the use of the number line.</p> <p>They develop ways of recording calculations using pictures etc. and begin to record their calculations using number sentences.</p> 	<p>Children will solve practical problems which involve multiplication in the context of doubling.</p> <p>They use practical resources and a range of different objects to support their understanding.</p>	<p>Children will solve practical problems which involve multiplication in the context of halving and sharing.</p> <p>They use practical resources and a range of different objects to support their understanding.</p>

Y2	Addition	Subtraction	Multiplication	Division
	<p>Children will use a 100 square to add tens and units. Find the largest number, add tens by jumping down and add units by jumping on.</p>  <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 units 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 units in one jump.</p> <p>$34 + 23 = 57$</p>  <p>Bringing through ten can help children become more efficient.</p> <p>$37 + 19 = 56$</p> 	<p>Children will use a 100 square to subtract tens and units. Find the largest number, subtract tens by jumping up and subtract units by jumping back.</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 units 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 units in one jump.</p> <p>$47 - 23 = 24$</p>  <p>Bringing through ten can help children become more efficient.</p> <p>$42 - 28 = 17$</p>  <p>Counting on: 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 'taking away'.</p>	<p>Children will develop their understanding of multiplication and use jottings to support calculation:</p> <p>✓ Repeated addition 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>$5 + 5 + 5 + 5$</p>  <p>and on a bead bar.</p> <p>$5 + 5 + 5 + 5$</p>  <p>✓ Commutativity 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 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>Children will develop their understanding of division and use jottings to support calculation</p> <p>✓ Sharing equally 6 sweets shared between 2 people, how many do they each get?</p>  <p>✓ Grouping or repeated subtraction There are 6 sweets, how many people can have 2 sweets each?</p>  <p>✓ Repeated subtraction using a number line or bead bar $12 \div 3 = 4$</p>  <p>The number of jumps shows the number of times the divisor can be subtracted from the dividend.</p> <p>✓ Using symbols to stand for unknown numbers to complete equations using inverse operations $\square \div 2 = 4$ $20 \div \triangle = 4$ $\square \div \triangle = 4$</p>

Y3	<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>Using expanded column method. When confident begin to exchange</p> $21 + 22 = 43$ $\begin{array}{r} 1 \ 0 \\ 20 \ 1 \\ \hline 20 \ 2 + \\ 40 + 3 = 43 \end{array}$ $107 + 134 = 241$ $\begin{array}{r} 1 \ 1 \ 0 \\ 100 \ 20 \ 7 \\ \hline 100 \ 20 \ 4 \\ 200 + 20 + 1 = 241 \\ 10 \end{array}$	<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>Using expanded column method. When confident begin to exchange</p> $36 + 22 = 58$ $\begin{array}{r} 1 \ 0 \\ 30 \ 6 \\ \hline 30 \ 2 \\ 50 + 4 = 54 \end{array}$ $41 + 20 = 61$ $\begin{array}{r} 1 \ 0 \\ 40 \ 1 \\ \hline 40 \ 2 \\ 50 + 4 = 54 \end{array}$ <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>Children will continue to use:</p> <ul style="list-style-type: none"> ✓ Repeated addition 4 times 6 is $6 + 6 + 6 + 6 = 24$ or 4 lots of 6 or 6×4 <p>Children should use number lines or bead bars to support their understanding.</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> $\square \times 5 = 20$ $3 \times \triangle = 18$ <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> <ul style="list-style-type: none"> ✓ Repeated subtraction using a number line <p>Children should also move onto calculations involving remainders.</p>  <p>Children will use an empty number line to support their calculation</p> $144 \div 4 = 36$  <p>Children should also move onto calculations involving remainders.</p>  <p>Chunking on a number line method</p> $40 \div 5 = 8$ $2 \times 5 = 10$ $5 \times 5 = 25$ $10 \times 5 = 50$  <p>Using symbols to stand for unknown numbers to complete equations using inverse operations</p> $26 \div 2 = \square$ $24 \div \triangle = 12$ $\square \div 10 = 8$
----	---	---	---	--

<p>Y4</p> <p>✓ Carry below the line:</p> $\begin{array}{r} 629 \\ + 48 \\ \hline 677 \end{array}$ $\begin{array}{r} 791 \\ + 42 \\ \hline 833 \end{array}$ $\begin{array}{r} 347 \\ + 28 \\ \hline 375 \end{array}$ <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 three-digit sums of money, with or without adjustment from the pence to the pounds; ✓ know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. £3.59 + 78p. 	<p>✓ Partitioning and decomposition</p> <p>794 - 288</p> <p>Step 1: $790 - 90 = 700$</p> <p>Step 2: $700 - 40 = 660$ (Adjust from 7 to 6)</p> <p>Step 3: $600 + 100 = 700$ (Adjust from 6 to 7)</p> <p>$600 - 90 = 510$</p> <p>$510 - 40 = 470$</p> <p>$470 - 8 = 462$</p> <p>This would be recorded by the children as:</p> $\begin{array}{r} 794 \\ - 288 \\ \hline 506 \\ - 100 \\ \hline 406 \\ - 40 \\ \hline 366 \\ - 8 \\ \hline 462 \end{array}$ <p>✓ Decomposition</p> <p>Children should:</p> <ul style="list-style-type: none"> ✓ be able to subtract numbers with different numbers of digits; ✓ 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; ✓ know that decimal points should line up under each other. $\begin{array}{r} 2328 \\ - 1238 \\ \hline 1090 \\ - 100 \\ \hline 990 \\ - 90 \\ \hline 900 \\ - 10 \\ \hline 890 \end{array}$	<p>Children will continue to use arrays where appropriate leading into the grid method of multiplication.</p> <p>✓ Grid method</p> <p>24 x 8</p> <p>40 x 8 = 320</p> <p>40 x 24 = 960</p> <p>88</p> <p>✓ TU x U</p> <p>(Short multiplication – multiplication by a single digit)</p> <p>23 x 8</p> <p>Children will approximate first</p> <p>23 x 8 is approximately 25 x 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> <p>72 ÷ 8</p> <p>72 ÷ 10</p> <p>72 ÷ 5</p> <p>72 ÷ 2</p> <p>72 ÷ 1</p> <p>Then onto the vertical method:</p> <p>Short division TU ÷ U</p> <p>Leading to subtraction of other multiples.</p> <p>23 x 8</p> <p>184</p> <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>
---	---	--	--

<p>Y6</p> <p>Children should extend the carrying method to number with any number of digits.</p> $\begin{array}{r} 7.488 \\ + 2.109 \\ \hline 9.597 \end{array}$ $\begin{array}{r} 4.284 \\ + 1.288 \\ \hline 5.572 \end{array}$ $\begin{array}{r} 4.412 \\ + 0.741 \\ + 0.483 \\ \hline 5.636 \end{array}$ <p>Using similar methods, children will add several numbers with different numbers of digits:</p> <ul style="list-style-type: none"> 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> $\begin{array}{r} 5411 \\ - 6467 \\ + 2484 \\ \hline 3788 \end{array}$ <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>THHTU x U (Short multiplication – multiplication by a single digit)</p> <p>4346 x 8</p> <p>Children will approximate first</p> <p>4346 x 8 is approximately 4346 x 10 = 43460</p> $\begin{array}{r} 4000 \quad 300 \quad 40 \quad 6 \\ + 20000 \quad 2400 \quad 320 \quad 48 \\ \hline 34328 \end{array}$ <p>HTU x TU</p> <p>(Long multiplication – multiplication by more than a single digit)</p> <p>372 x 24</p> <p>Children will approximate first</p> <p>372 x 24 is approximately 400 x 25 = 10000</p> $\begin{array}{r} 20 \quad 200 \quad 70 \quad 2 \\ + 4000 \quad 400 \quad 40 \quad 4 \\ + 1000 \quad 100 \quad 10 \quad 1 \\ + 100 \quad 10 \quad 1 \\ \hline 8924 \end{array}$ <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:</p> <p>4.92 x 3</p> <p>Children will approximate first</p> <p>4.92 x 3 is approximately 5 x 3 = 15</p> $\begin{array}{r} 4 \quad 92 \\ \times 3 \\ \hline 12 \quad 36 \\ + 1476 \\ \hline 1476.36 \end{array}$ <p>Use short multiplication method when confident to exchange.</p> $\begin{array}{r} 432 \\ \times 57 \\ \hline 3024 \\ + 21600 \\ \hline 24624 \end{array}$	<p>Children will continue to use written methods to solve short division TU ÷ U and HTU ÷ U.</p> <p>Long division HTU ÷ TU</p> $\begin{array}{r} 34 \overline{) 747} \\ \underline{68} \\ 67 \\ \underline{67} \\ 0 \end{array}$ <p>Any remainders should be shown as fractions, i.e. if the children were dividing 32 by 10, the answer should be shown as 3 $\frac{2}{10}$, which could then be written as 3 $\frac{1}{5}$ in its lowest terms.</p> <p>Extend to decimals with up to two decimal places. Children should know that decimal points line up under each other.</p> $\begin{array}{r} 37 \overline{) 134.2} \\ \underline{111} \\ 23 \\ \underline{21} \\ 20 \\ \underline{19} \\ 10 \\ \underline{9} \\ 10 \\ \underline{10} \\ 0 \end{array}$
---	--	--	---