

Spring Gardens Primary School

Calculation Policy

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Progression of written methods for addition

Mental images and pictures

Establish mental methods, based on a good understanding of cardinal and ordinal numbers as well as place value.

Use of informal jottings to aid mental calculations.

Numbered lines

Numberlines and practical resources are used to support calculation. Teacher *demonstrates* the use of the numberline.

Begin to use **numbered** lines to support own calculations using a numbered line to count on in ones.



Empty number line Use 'empty number lines' starting with the larger

number and counting on.

First counting on in tens and then ones.

Then as children become more efficient by adding the tens in one jump and the units in one jump (by using the known fact 4 + 3 = 7).

Partitioning

Partition number into hundreds, tens and units and then add each separately. 125 + 114 100 + 100 = 200 20 + 10 = 30 5 + 4 = 9 200 + 30 + 9 = 239

Expanded horizontal

50+4 20+3 70+7

Expanded vertical column

Vertical addition using an expanded column method, adding the least significant digit first in preparation for 'carrying'.

67

91

11(7+4)

80 (60 + 20)

+ 24

Formal method Formal vertical method of addition using 'carrying'

+ 42 825

Уе	Addition	EYFS COULD		
 Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs Represent and use number bonds and related subtraction facts within 20 	• Add inclu	l and subtract one-digit and two-digit numbers to 20, uding zero.	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = - 9.	
Calculation methods		Steps 2 Success		
Use of apparatus to count one more - children use a variety of apparatus/fingers to find the number that is one more than five, they describe it as 'five add one is six' or 'five plus one is six' and record it in a number sentence as $5 = 1 = 6$. Children will use Numicon (kit 1) shapes and fit them together when combining numbers so they physically 'do' the calculation and 'see' the effects of their actions.		To find the number one more using counters: Count out the right number of counters To find one more add another counter Count the amount again Count the amount again Cou		
Use of pictures and marks to count all - a child doing $3 + 5$ counts out three counters and then five counters and then finds the total by counting all the counters.		To use a numbered line to count on:		
Numbered lines: teacher to initially model the use of a numbered line. Later, children then begin to use numbered lines to support their own calculations by counting on in ones.		Find the first number in the sentence on the number line $\frac{1}{0} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \frac{1}{10}$ Found on the second number, drawing a loop to show each		
+ = signs and missing numbers:		jump.		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		The number that you land on is the answer.		

	Year 2 -	Addit	ion	Year 1 COULD
Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	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		brial Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods	
Calcul	ation methods			Steps 2 Success
Numicon: children will continue t to 10 and 20, as well as support t	o use Numicon to support addition pairs he addition of 2 digit numbers.			
Numbered lines: Children use numbered lines to support their own calculations to count on in ones. 7 + 4 = 11 Blank number lines: Children will use 'empty number starting with the larger number	$\frac{1}{0} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10}$	To use • R • V • V	the expanded ve ead the number s Vrite the largest Vrite the smalles haking sure the d	ertical column method for addition: sentence. number first (one digit in each box!). t number underneath the first number igits are in the correct columns. 3 5 2
counting on.	34 44 5			+ <u>244</u>
Expanded vertical column meth HTU + TU adding least significa out in columns use place value co 3 5 8 + 7 3 1 1 1 2 0 3 0 0 4 3 1	od: nt digits first. Where calculations are set rrectly:	• A	3 5 2 + <u>2 4 4</u> 6 9 0 <u>5 0 0</u> <u>5 9 6</u> Ndd the 3 new nur	 Add the ones and write the number underneath. Add the tens and write the number underneath. Add the hundreds and write the number underneath. <u>REMEMBER PLACE VALUE!</u>
		n n	umber underneat	h.

	Year 3 - A	Addition	Year 2 COULD
Add and subtract numbers mentally, including: a three-digit number and ones; 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; estimate the answer to a calculation and use inverse operations to check answers		Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
Calculation me	thods	5	teps 2 Success
Blank number lines: Children will continue to use empty number numbers, including compensation where app Count on from the largest number irrespect	lines with increasingly large ropriate. tive of the order of the	Formal column method Write each digit Start with the u	: in the correct place value column. nits column and add up all the
calculation. 86+38		numbers in that column.	
+30 +4 +4 86 116 120 124	Bridging through ten can help children become more efficient.	If the units add -put the units of added	up to more than 10: the answer in the column being
Expanded vertical column method: HTU + TU adding least significant digits find out in columns use place value correctly: tens	rst. Where calculations are set	-carry the tens d below the botto H T U	ligit to the next column on the left om line.
358		135	
$\frac{+7.5}{11}$ 1 2 0		+ <u>1 2 /</u> <u>2</u> <u>1</u>	
$\frac{300}{431}$		Repeat with the tens that have b	tens column (don't forget to any add een 'carried' over). Again, if the tens
367Carry+85 $\frac{452}{11}$ they b	digits into the next underneath calculation, if ridge 10s, 100s etc.	add up to more t the tens column in the hundreds Repeat with the	han 100, put the number of tens in and carry the hundred below the line column. hundreds column.

Year 4 - 1	Addition Year 3 COULD		
 Add and subtract numbers with up to 4 digits using the f columnar addition and subtraction where appropriate Estimate and use inverse operations to check answers to 	ormal written methods of a calculation Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.		
Calculation methods	Steps 2 Success		
Expanded vertical column method: HTU + TU adding least significant digits first. Where calculations are set out in columns use place value correctly (units under units, tens under tens) 3 5 8 $\frac{+73}{11}$ 1 2 0 $\frac{300}{431}$	 Formal column method: Write each digit in the correct place value column. Start with the units column and add up all the numbers in that column. If the units add up to more than 10: put the units of the answer in the column being added carry the tens digit to the next column on the left below the bottom line. 		
Formal column method with up to 4-digits: ²⁵⁶⁷ + <u>1247</u> <u>3814</u> 11 Carry digits into the next column underneath calculation, if they bridge 10s, 100s etc.	 HTU 135 +<u>127</u> <u>2</u> Repeat with the tens column (don't forget to any add tens that have been 'carried' over). Again, if the tens add up to more than 100, put the number of tens in the tens column and carry the hundred below the line in the hundreds column. Repeat with the hundreds column. 		

Year 5 - Addition		Year 4 COULD	
Add and subtract numbers mentally with increasingly large numbers.	 Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy. 		Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Calculo	ation methods		Steps 2 Success
Formal column method with <u>mo</u>	re than 4-digits:	Formal column metho Write each dig	d: it in the correct place value column.
25673 + <u>12472</u> <u>38145</u> 11	Carry digits into the next column underneath calculation, if they bridge 10s, 100s etc.	Start with the in that column.If the units ad	units column and add up all the numbers d up to more than 10:
DECIMALS: Add two or more decimal fractions with up to 3 digits and the same number of decimal places. 72.5 Km + <u>54.6 Km</u> <u>127.1 Km</u> <u>11.96 Sec</u>		-put the units of the answer in the column being added -carry the tens digit to the next column on the left below the bottom line. HTU 135 + 127 1	
		 Repeat with the tens that have add up to more tens column and hundreds colum Repeat with the tens with the tens tens tens colum 	e tens column (don't forget to any add been 'carried' over). Again, if the tens than 100, put the number of tens in the d carry the hundred below the line in the nn. e hundreds column.

 perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers identify common factors, common multiples and prime numbers Calculation method Calculation method Steps 2 Success Formal column method with more than 4-digits: 25673 12472 38145 1 Add several numbers with different numbers of digits. 6432 4681 786 42 1944 121 Use their knowledge of the order of operations to carry out calculations involving the four operations. Start with the units' column and add up all the numbers in that column. If the units add up to more than 10: -put the units of the answer in the column being added -carry the tens digit to the next column on the left below the bottom line. H T U 125 		Year 6 - Ad	dition	Year 5 COULD
Calculation method Steps 2 Success Formal column method with more than 4-digits: Formal column method: 25673 Write each digit in the correct place value column. *12472 Start with the units' column and add up all the numbers in that column. 38145 Start with the units' column and add up all the numbers in that column. Add several numbers with different numbers of digits. If the units add up to more than 10: -put the units of the answer in the column being added -carry the tens digit to the next column on the left below the bottom line. + + 3 11944 121 5+7=12	 perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers 	Use their knowledge of the order of operations to carry out calculations involving the four operations.	 Solve addition and subtraction multi- deciding which operations and meth- Solve problems involving addition an 	i-step problems in contexts, ods to use and why d subtraction.
Formal column method with more than 4-digits: 25673 25673 * * 12472 38145 38145 1 11 Start with the units' column and add up all the numbers in that column. Add several numbers with different numbers of digits. If the units add up to more than 10: -put the units of the answer in the column being added -put the units of the next column on the left below the bottom line. * 11944 121 135	Calculation method		Steps 2 Success	
DECIMALS: Add two decimal fractions with up to 4 digits and one or two decimal places. 124.9 Km + 7.25 Km 132.15 Km 11 11 11 128.000000000000000000000000000000000000	Formal column method with more than 4-dig 25673 + <u>12472</u> <u>38145</u> 11 Add several numbers with different numbers of 6432 4681 786 42 <u>+</u> <u>311944</u> 121 DECIMALS: Add two decimal fractions with up decimal places. <u>124.9 Km</u> + <u>7.25 Km</u> <u>132.15 Km</u> <u>11</u>	of digits.	 Formal column method: Write each digit in the corres Start with the units' column a numbers in that column. If the units add up to more t -put the units of the answer is added -carry the tens digit to the needelow the bottom line. HTU 135 +127 1 Repeat with the tens column tens that have been 'carried' tens add up to more than 100 tens in the tens column and cothe line in the hundreds colum Repeat with the hundreds column 	ect place value column. and add up all the than 10: in the column being ext column on the left s (don't forget to add over). Again, if the 0, put the number of carry the hundred below mn. lumn.