

**St. John's C. of E.
Primary School**



Mathematics Calculation Policy

September 2017

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, so that they develop both conceptual understanding and fluency in the fundamentals of mathematics. Whilst interpreting signs and symbols involved with calculation, orally in the first instance, children use models and images to support their mental and written methods of calculation. As children's mental methods are strengthened and refined they begin to work more efficiently, which will support them with using succinct written calculation strategies as they are developed.

The ability to calculate mentally forms the basis of all methods of calculation and has to be maintained and refined. A good knowledge of numbers or a 'feel' for numbers is the product of structured practice through progression in relevant practical maths experiences and visual representations.

By the end of Year 6, children will be equipped with efficient mental and written calculation methods, which they use with fluency. Decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. At whatever stage in their learning, and whatever method is being used, children's strategies must still be underpinned by a secure understanding and knowledge of number facts that can be recalled fluently.

The overall aims are that when children leave primary school they:

- Are able to recall number facts with fluency, having developed conceptual understanding through being able to visualise key ideas – such as those related to place value - through experience with practical equipment and visual representations;
- 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, written method of calculation for each number operation that they can apply with confidence when undertaking calculations that they cannot carry out mentally;
- Are able to make connections between all four number operations, understanding how they relate to one another, as well as how the rules and laws of arithmetic can be applied



Mathematical Vocabulary

<u>Addition</u>	<u>Subtraction</u>	<u>Multiplication</u>	<u>Division</u>
Add	Take away	Repeated addition	Groups of
Plus	Count back	Times	Into groups of
More	Less	Array	Halve
Altogether	Minus	Multiply	Share
Total	Fewer	Groups of	Equally
Increase	Difference	Double	Into lots of
Make	Count on	Multiplication	Divided by
And	How many more than...	Multiples	Half
Carry	Subtract	Factor	Quarter
Symbol	Decrease	Product	Remainder
Operation	Exchange	Lots of	Factor
Equals	Symbol	Arrays	Divisible
Addend	Operation	Symbol	Divisor
Sum*	Equals	Operation	Dividend
		Equals	Quotient
			Regroup
			Symbol
			Operation
			Equals

* 'sum' is a term used for an addition calculation. No other operation uses this term.

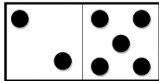



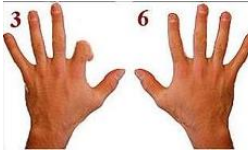
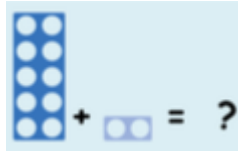






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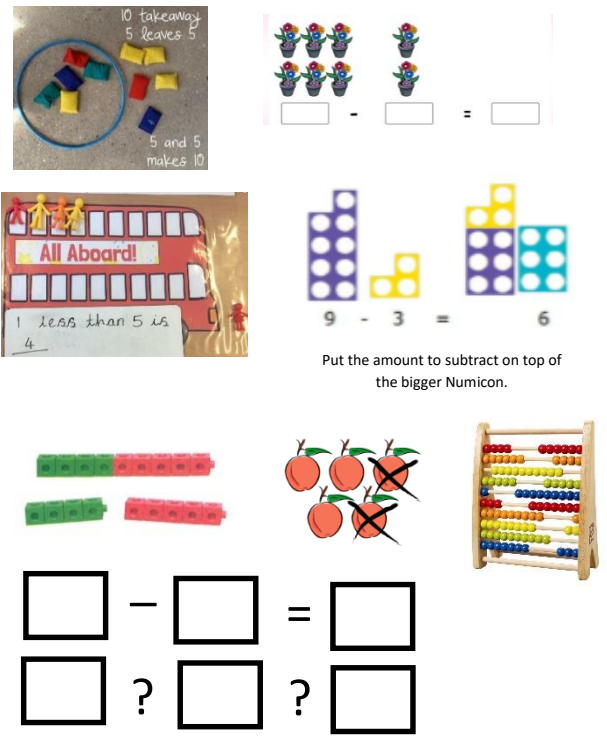
Reception

Addition

Year Group	Number Facts Pupils should be taught to:	Written Calculations and Appropriate Models and Images to Support Conceptual Understanding	
Reception	<ul style="list-style-type: none"> Children count reliably with numbers from 1 to 20 Use number bonds and related number facts within 10 	<p><u>Must have skills before children can start to calculate</u> Children to count on and back using chanting, rhymes, songs and stories numbers to 10 initially and then move to 20.</p> <p>Children to recognise, write, match numbers to 10. Children to recognise lots of different representations of the same number.</p> <p>Children to show understanding of one to one correspondence to ten. Children to be able to count up to ten objects accurately.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>How many spots? ____</p> </div> <div style="text-align: center;"> $3 + 2 =$  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  $+$  $=$ </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  $+$  $= ?$ </div> <div style="text-align: center;">  </div> </div> <div style="text-align: center; margin-top: 20px;"> $\square + \square = \square$ $\square ? \square ? \square$ </div> <p style="text-align: right; font-size: small;"><i>Experiment with moving the symbols e.g. $10 = 9 + 1$</i></p>
		<p>Children to find one more than a given number to 10. One more than ____ is _____. Children to complete practically first.</p> <p>Children to practically move objects to ensure accurate counting.</p> <p>Children to combine 2 one digit numbers to add using practical objects and say full sentence.</p> <p>Children to count on to find the answer.</p> <p>Children to use digit cards to represent pictorial calculations.</p> <p>Children to record answers to a calculation</p> <p>Children to be able to write the calculation, initially with blank boxes to support layout structure, moving to independent writing of calculations.</p> <p><u>Repeat all the above steps to 20 once mastered with numbers 1-10</u></p>	







Subtraction

Year Group	Number Facts Pupils should be taught to:	Written Calculations and Appropriate Models and Images to Support Conceptual Understanding
Reception	<ul style="list-style-type: none"> Children count reliably with numbers from 1 to 20 Children to have rapid recall of one more and one less 	<p><u>Must have skills before children can start to calculate</u> Children to count on and back using chanting, rhymes, songs and stories numbers to 10 initially and then move to 20.</p> <p>Children to recognise, write, match numbers to 10. Children to recognise lots of different representations of the same number.</p> <p>Children to show understanding of one to one correspondence to ten. Children to be able to count groups of up to ten objects accurately.</p> <p>Children to take away the smallest number from the largest number using practical objects. Children to find one less of a given number to 10. One less than ____ is ____</p> <p>Children to count back from the largest number to find an answer</p> <p>Children to use digit cards to represent pictorial calculations. Children to record answers to a calculation. Children to ensure larger number is first and then say full sentence aloud.</p> <p>Children to be able to write the calculation, initially with blank boxes to support structure, moving to independent writing of calculations.</p> <p><u>Repeat all the above steps to 20 once mastered with numbers 1-10</u></p> 



Multiplication

Year Group	Number Facts Pupils should be taught to:	Written Calculations and Appropriate Models and Images to Support Conceptual Understanding
Reception	<ul style="list-style-type: none"> Children count reliably with numbers from 1 to 20 Children will begin to know their doubles to 10 as rapid recall 	<ul style="list-style-type: none"> Children will experience equal groups of objects and will count in 2s. They will work on practical problem solving activities involving equal sets or groups. Children will count pairs of socks, use Numicon and their fingers. Children will understand the term 'double' and use practical objects to find doubles of numbers within 20 Double ___ is ___.     <p style="text-align: right;">$2 + 2 = 4$</p>

Division

Year Group	Number Facts Pupils should be taught to:	Written Calculations and Appropriate Models and Images to Support Conceptual Understanding
Reception	<ul style="list-style-type: none"> Children count reliably with numbers from 1 to 20 	<ul style="list-style-type: none"> Children will understand the term 'half' and use practical objects such as fruit, playdough, paper shapes, cakes to find half. They understand it is two equal amounts. Children to find half of amounts by sharing equally between two groups. Children to use practical resources e.g. counters, plates of food, animals into pens, flowers into vases, ladybirds Half of ___ is _____. Children will understand equal groups (other than 2) through practical sharing and share items out in play and problem solving using counter, cubes and objects. Children will use practical resources e.g. lily pads and frogs, plates and food to share into other group amounts equally. ___ shared between ___ is _____. Children will be familiar with the language fair and equal and be able to explain what it means. 