



St. Mary's Calculation Policy KS2: ADDITION: Summer 2020

<p>KS1</p> <p>Appendix 2: Pupil target grids</p>	<p>KS1</p> <p>Pupils should practise addition to 20 and within to become increasingly fluent. They should use the facts they know to derive others, e.g. using $7 + 3 = 10$ to find $17 + 3 = 20$, $70 + 30 = 100$.</p> <p>They should use concrete objects and practical apparatus, such as bead strings and number lines to explore additions including missing numbers. Use pictorial representations such as bar models and whole part diagrams to show additive relationships. 100 squares could be used to explore patterns in calculations such as $74 + 11$, $77 + 9$ encouraging children to think about 'What do you notice?' where partitioning or adjusting is used.</p> <p>Pupils should learn to check their calculations, by using the inverse. They should continue to see addition as both combining groups and counting on. They should use Dienes to model partitioning into tens and ones* and learn to rearrange numbers in different ways e.g. $23 = 20 + 3 = 10 + 13$. Show understanding that adding zero leaves a number unchanged.</p>	
<p>Year</p>	<p>3</p>	<p>4</p>
<p>Layers of vocabulary</p>  <p>Appendix 1a Beck's Tiers of Vocabulary</p> <p>Appendix 1b: Vocabulary book</p>	<p>Basic to subject specific (Beck's Tiers): +, add, addition, more, plus, make, sum, total, altogether, score, double, near double, one more, two more... ten more... one hundred more, How many more to make...? How many more is... than...? How much more is...?</p> <p>Instructional vocabulary: explain your method, explain how you got your answer, give an example of... show how you... show your working</p> <p>NFER – language of tests and questions estimate, write....in order, complete, circle, estimate, tick, draw, draw two, draw the arrow, show your working, use the..., what number, complete, shade, write in, true or false, tick two, circle all, write a possible, use a ruler, What numbers could be? How many are left? What is next...? What is...? How many...? Which of these?</p>	<p>Basic to subject specific (Beck's Tiers): add, addition, more, plus, increase, sum, total, altogether, score, double, near double, How many more to make...?</p> <p>Instructional vocabulary: calculate, work out, solve, investigate, question, answer, check</p> <p>NFER – language of tests and questions write, order, complete, draw three, write....in the boxes, show your working, use the method, write the missing, shade, write in order, tick, write your answer as..., write the letter (can be used more than once), describe, write one word, write your answer in, match, to make...you need, draw four, on which, calculate, write these numbers, use the coordinates to draw, estimate, in each box, write these values, circle the best, complete the table, round each number, draw one line, circle all, tick three, plot, Who takes...? How many? What is...? What number?</p>



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NC 2014	Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction.		Add and subtract numbers with up to 4 digits using the formal written method of columnar addition and subtraction where appropriate. Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.						
<p>Developing Conceptual/ Procedural Understanding</p> <p>NB: carried digits must be positioned below the line.</p>	<p>Near doubles $13+14 =$ Double $13= 26$ $26+1 =27$ or Double $14 =28$ $28-1=27$</p> <p>Using known facts $40 + 80 = 120$ using $4 + 8 = 12$ So $400 + 800 = 1200$</p> <p>Remodelling strategy $243 + 198$ $241 + 200 = 441$</p> <p>Place value materials to represent calculations Diennes and then place value counters.</p> <p>$243 + 198 =$</p>  <p>Teaching point – you cant have more than 9 in each column.</p>	<p>Start with least significant digit</p> $\begin{array}{r} 67 \\ + 24 \\ \hline 11 \end{array}$ <p>(7+4)</p> $\begin{array}{r} 11 \\ + 80 \\ \hline 91 \end{array}$ <p>(60+20)</p> <p>“7 add 4 equals 11 and 60 add 20 equals 80. 1+ 0 = 1 and 1 ten + 8 tens =9 tens”</p> $\begin{array}{r} 625 \\ + 48 \\ \hline 13 \end{array}$ <p>(5+8)</p> $\begin{array}{r} 60 \\ + 600 \\ \hline 660 \end{array}$ <p>(20+40)</p> $\begin{array}{r} 673 \\ + 600 \\ \hline 1273 \end{array}$ <p>(600+0)</p> <p>All language in the context of the place value and the mental addition of the totals to be done in any order.</p>	<p>Columnar addition</p> $\begin{array}{r} 625 \\ + 48 \\ \hline 673 \end{array}$ <p>Representing problems There are 334 children at Springfield School and 75 at Oak Nursery. How many children are there altogether?</p>	<p>Using known facts $40 + 80 = 120$ using $4 + 8 = 12$ So $400 + 800 = 1200$ and $4000+8000=12,000$</p> <p>Remodelling strategy $3548 + 1998$ $3546 + 2000 = 5546$</p> <p>Place value materials to represent calculations</p>	<p>Columnar addition</p> $\begin{array}{r} 587 \\ + 475 \\ \hline 1062 \end{array}$ <p>“7 add 5 equals 12. That’s 2 units and 1 ten to carry over. 80 add 70 equals 150 and the1 ten to carry makes 160. That’s 6 tens and 100 to carry over. 500 add 400 equals 900 and the 1 hundred to carry makes 1000”</p> $\begin{array}{r} 7648 \\ + 1486 \\ \hline 14 \end{array}$ <p>(8+6)</p> $\begin{array}{r} 120 \\ + 800 \\ \hline 920 \end{array}$ <p>(40+80)</p> $\begin{array}{r} 1000 \\ + 8000 \\ \hline 9000 \end{array}$ <p>(600+400)</p> $\begin{array}{r} 9134 \\ + 1486 \\ \hline 111 \end{array}$ <p>(7000+1000)</p>	<p>Columnar addition (decimals) in contexts such as money and measurement</p> $\begin{array}{r} 12.45 \\ 7.36 \\ + 24.50 \\ \hline 44.31 \end{array}$ <p>Representing problems There are 259 more boys than girls in Lucy’s school. If there are 789 girls, how many pupils are there altogether?</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 10px auto; text-align: center;">?</div> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">759</td> <td style="padding: 5px;">759</td> <td style="padding: 5px;">+ 259</td> </tr> </table>	759	759	+ 259
759	759	+ 259							



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Known facts	Derive and use addition and subtraction facts to 100, e.g. $33+67=100$.		Derive and use addition and subtraction facts (for multiples of 10) to 1000, e.g. $330+670=1000$.	
Essential knowledge	Add single digit bridging through boundaries	Add multiples of 10, 100	Fluency of 2 digit + 2 digit	Add multiples of 10, 100 and 1000
	Partition second number to add	Pairs of 100 (complements of 100)	Partition second number to add	Decimal pairs of 10 and 1
	Use near doubles to add	Add near multiples of 10 and 100 by rounding and adjusting	Use near doubles to add	Adjust both numbers before adding
	Partition and recombine		Add near multiples	Partition and recombine

Year	5	6
Layers of vocabulary  Appendix 1a Beck's Tiers of Vocabulary Appendix 1b: Vocabulary book	<p>Basic to subject specific (Beck's Tiers): add, addition, more, plus, increase, sum, total, altogether, score, double, near double, How many more to make...?</p> <p>Instructional vocabulary: put, place, arrange, rearrange, change, change over split, separate</p> <p>NFER– language of tests and questions complete the sequence, circle the same as, draw four lines, circle the, circle the number that is not, circle two, write yes or no to a statement, circle all, write the, write the missing, circle the incorrect, show your method, show your working, circle three, by how much, calculate, estimate, shade, write the missing, use the diagram, complete the table, circle the number that is both, write a, b, c, d, label, true or false, order, draw a line, write the missing digits, circle true and false, What number is? Which is the closest? Which one of these must also? Who gets the most? What is the total number?</p>	<p>Basic to subject specific (Beck's Tiers): add, addition, more, plus, increase, sum, total, altogether, score, double, near double, How many more to make...?</p> <p>Instructional vocabulary: put, place, arrange, rearrange, change, change over adjusting, adjust, split, separate, carry on, continue, repeat, predict, describe the pattern, describe the rule, find, find all, find different, investigate, What comes next?</p> <p>NFER– language of tests and questions which expression, write three, complete, draw the, explain why, write each number, show your method, tick the, calculate, increase by, complete the tables, circle all, calculate, What was the...? What is the difference? How much? What are...? What is...? What could...? What number is...? Which of these...?</p>



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NC 2014	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.		Solve problems involving addition, subtraction, multiplication and division.	
Developing Conceptual/ Procedural Understanding	<p>Columnar addition Include calculations involving more than 2 numbers and carrying figures >1.</p> $\begin{array}{r} 25567 \\ 16397 \\ +15984 \\ \hline 57948 \\ 1121 \end{array}$ <p>Include calculations with 'empty columns'. 124.9 + 7.25</p> $\begin{array}{r} 124.90 \\ + 7.25 \\ \hline 132.25 \\ 11 \end{array}$	<p>Representing problems If 2541 is the answer, what's the question? - Can you create three addition calculations? - Can you create three subtraction calculations? - Did you use a strategy?</p>	<p>Columnar addition Include calculations with up to 3 'empty columns'. 128.7 + 3.014</p> $\begin{array}{r} 128.700 \\ + 3.014 \\ \hline 131.714 \\ 1 \end{array}$	<p>Representing problems 7208 females attended a concert as well as 8963 males. There were originally 20000 seats on sale. How many empty seats were there at the concert?</p>
Known facts	Derive and use addition and subtraction facts to 10 and 1, E.g. 3.3 + 6.7 = 10 and so 0.33 + 0.67 = 1. BIDMAS.		All the KS2 required facts. BIDMAS.	
Essential knowledge	Fluency of 2 digit + 2 digit including with decimals	Add multiples of 10, 100, 1000 and tenths	Fluency of 2 digit + 2 digit including with decimals	Add multiples of 10, 100, 1000, tenths and hundredths
	Partition second number to add	Use number facts, bridging and place value	Partition second number to add	Use number facts, bridging and place value
	Adjust numbers to add	Partition and recombine	Adjust numbers to add	Partition and recombine
	Negative numbers, counting forwards and backwards through zero		Negative numbers, calculate intervals across zero	