

# Ashcroft Nursery and Infant School

## Mental Calculation Policy 2018



### Introduction

We believe that Mental Maths should...

- be wider than just mental calculation
- happen every day
- give children a wide, frequent, planned variety of opportunities to develop their mental maths skills
- include reasoning and communicating

The overall aim is that when children leave our schools they:

- have a secure knowledge of number facts and 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 apply 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 for each operation that they can apply with confidence when undertaking calculations that they cannot carry out mentally;
- use a calculator effectively, using their mental skills to monitor the process, check the steps involved and decide if the numbers displayed make sense.

Mental maths is taught daily, during the mental oral warm up and at time deemed appropriate by the class teacher. This involves practice in the quick recall of number facts, the solving of problems and discussion of effective strategies for carrying out mental calculations.

We aim to establish a secure understanding of mental calculation strategies appropriate to each child's age and stage of mathematical development. Children's own mental calculation strategies are valued. Children are encouraged to share their strategies with each other and with the teacher. Teachers encourage children to use an efficient, accurate and reliable strategy for each calculation.

Our school Calculation Policy provides a structured and systematic approach to teaching calculation skills. There is a high emphasis on developing a secure base of mental skills before beginning to work towards more formal written methods; our school embraces this approach.

## RECEPTION

	Addition	Subtraction	Multiplication	Division	Fractions
Mental Calculations	<p>Children count reliably with numbers from one to 20 and place them in order.</p> <p>Children can say which number is one more or one less than a given number up to 20</p> <p>Recall number bonds of numbers up to 10 e.g. 0 and 5 make 5, 1 and 4 make 5, 3 and 2 make 5, 0 and 6 make 6 etc...</p>		<p>They use practical resources to solve multiplication and division problems.</p> <p>e.g. how many wheels on 3 cars? If there are 3 dogs in each house and 4 houses, how many dogs are there?</p> <p>e.g. share these 6 sweets between 3 people.</p>		<p>They find halves of objects and shapes in practical situations: ie. Cut this banana into half</p>

**YEAR 1**

		<b>Addition</b>	<b>Subtraction</b>	<b>Multiplication</b>	<b>Division</b>	<b>Fractions</b>
<b>Mental Calculations</b>	<b>Recall</b>	<ul style="list-style-type: none"> <li>Count up and back to and across 100, or from any given number</li> <li>Given a number, identify one more and one less</li> <li>Number pairs with a total of 10 e.g. 3+7, or what to add to a single-digit number to make 10, e.g. <math>3 + \Delta = 10</math></li> <li>Number pairs with a total of 20 e.g. 14+6, or what to add to a number to make 20 e.g. <math>20 = 15 + \Delta</math></li> <li>The story of all numbers to 10. (know addition and subtraction facts for each number) e.g 7: <math>3+4, 5+2, 6+1, 7+0, 7-6 =, 7-5 =</math></li> <li>Add any single-digit number to or from a multiple of 10, e.g. <math>60+5</math></li> <li>Addition doubles for all numbers to at least 10 e.g. <math>8+8</math></li> </ul>		<ul style="list-style-type: none"> <li>Doubles and halves of all numbers to 10.</li> <li>Odd and even numbers to 100</li> </ul>		Recall halves of all numbers to 10.  e.g. $\frac{1}{2}$ of 10 = 5
	<b>Skills (with jottings )</b>	<ul style="list-style-type: none"> <li>Add and subtract a pair of numbers less than 20 e.g. <math>14 + 5, 18-3</math></li> <li>Add or subtract a single digit number to a multiple of 10 e.g. <math>10+7, 7 + 30, 10 - 3 = 60 -3 =</math></li> <li>Add near doubles e.g. <math>5+6</math></li> <li>Use patterns of similar calculations e.g. <math>(10-0, 10-1, 10-2)</math></li> </ul>		<ul style="list-style-type: none"> <li>Count on and back to zero in ones. Count up to and beyond 100 e.g. Practice counting from any number 45,46,47,48 or 87, 86, 85, 84</li> <li>Count on and back in twos, fives and tens. Use practical resources to help visualise (socks, gloves, etc )</li> </ul>		
	<b>Strategies</b>	<ul style="list-style-type: none"> <li>Recorder numbers when adding e.g. putting the largest number first</li> <li>Count on or back in ones, twos and tens</li> <li>Partition small numbers e.g. <math>8+3 = 8+2+1 =</math></li> <li>Partition: double and adjust e.g. <math>7+8 = 7+7+1</math></li> <li>Bridge through 10 and later 20 when adding a single digit number</li> <li>Add 9 to a single digit number by adding 10 and subtracting</li> </ul>		<ul style="list-style-type: none"> <li>Use patterns of last digits, e.g. 0 and 5 when counting in fives</li> </ul>		

**YEAR 2**

		<b>Addition</b>	<b>Subtraction</b>	<b>Multiplication</b>	<b>Division</b>	<b>Fractions</b>
<b>Mental Calculations</b>	<b>Recall</b>	<ul style="list-style-type: none"> <li>Addition and subtraction facts for all numbers up to at least 10, e.g. 3+4, 8-5</li> <li>The story of all numbers to 20</li> <li>All pairs of multiples of 10 with totals up to 100, e.g. 30+70, or <math>60 + \square = 100</math></li> <li>What must be added to any two-digit number to make the next multiple of 10, e.g. <math>52 + \square = 60</math></li> <li>Addition doubles for all numbers to 20, e.g. 17+17 and multiple of 10 to 50, e.g. 40+40</li> </ul>		<ul style="list-style-type: none"> <li>Doubles of all numbers to 20 e.g. double 13, and corresponding halves e.g. <math>40 + 40</math></li> <li>Doubles of multiples of 10 to 50 e.g. double 40, and corresponding halves</li> <li>Multiplication facts for the 2,3,5 and 10 times-tables, and corresponding division facts e.g. <math>7 \times 10</math>, <math>60 \div 10</math></li> <li>Odd and even numbers to 100</li> </ul>		<p>To be able to count in halves.</p> <p>e.g. <math>\frac{1}{2}</math>, 1, <math>1\frac{1}{2}</math>, 2, <math>2\frac{1}{2}</math>, 3</p>
	<b>Skills ( with jottings )</b>	<ul style="list-style-type: none"> <li>Add or subtract a pair of single-digit numbers, including crossing 10, e.g. 5+8, 12- 7</li> <li>Add or subtract any single-digit number to or from a multiple of 10, e.g. <math>60 + 5</math>, <math>80 - 7</math></li> <li>Add or subtract a single-digit number to or from a two-digit number, including crossing the tens boundary, e.g. <math>23 + 5</math>, <math>57 - 3</math>, then <math>28 + 5</math>, <math>52 - 7</math></li> <li>Add or subtract a multiple of 10 to or from any two-digit number, e.g. <math>27 + 60</math>, <math>72 - 50</math></li> <li>Add or subtract 2 two digit numbers</li> <li>Add or subtract 3 one digit numbers</li> <li>Add 9, 19, 29,....or 11, 21, 31.....(by adding multiples of 10 and adjusting)</li> <li>Add near doubles, e.g. <math>13 + 14</math>, <math>39 + 40</math></li> <li>Partition numbers in different ways e.g. <math>23 = 20 + 3</math>, <math>23 = 13 + 10</math></li> </ul>		<ul style="list-style-type: none"> <li>Double any multiple of 5 up to 50, e.g. double 35</li> <li>Halve any multiple of 10 up to 100, e.g. halve 90</li> <li>Find half of even numbers to 40</li> <li>Find the total number of objects when they are organised into groups of 2, 3, 5, or 10</li> </ul>		
	<b>Strategies</b>	<ul style="list-style-type: none"> <li>Reorder numbers when adding</li> <li>Partition: bridge through 10 and multiples of 10 when adding and subtracting</li> <li>Partition and combine multiples of ten and ones</li> <li>Use knowledge of pairs making 10</li> <li>Partition: Count on in tens and ones to find total</li> <li>Partition: Count on or back in tens and ones to find the difference</li> <li>Partition: add tens and ones recombine</li> <li>Partition: subtract tens and then ones. E.g. subtract 27 by subtracting 20 then subtracting 7</li> <li>Partition: add a multiple of 10 and adjust by 1</li> <li>Partition: double and adjust</li> </ul>		<ul style="list-style-type: none"> <li>Partition: double tens and ones separately, then recombine</li> <li>Use knowledge that halving is the inverse of doubling and that doubling is equivalent to multiplying by two</li> <li>Use knowledge of multiplication facts from the 2, 5 and 10 times-tables, e.g. recognise that there are 15 objects altogether because there are three groups of five</li> <li>To multiply and divide by 10 by shifting the digits to the left for multiplication and right for division e.g. <math>23 \times 10 = 230</math>, <math>40 \div 10 = 4</math></li> </ul>		