

ADDITION GUIDELINES – Written Arithmetic

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<p><u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Written compact method</u></p> <ul style="list-style-type: none"> • Add numbers with up to 4 digits using the formal written method of columnar addition • Include addition of numbers of different lengths eg $1,034 + 586$ • Addition of decimals up to 2 decimal places and including in the context of money and measures • Include calculations that involve missing digits and use column addition to help solve them eg. <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px; text-align: center;">2</td></tr></table> + <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px; text-align: center;">4</td><td style="width: 20px; height: 20px;"></td></tr></table> = 81 • Ensure that columns are labelled and the addition sign is on the right-hand side <p>Example 1: $6,584 + 5,848 = 12,432$</p> <table style="margin-left: 20px;"> <tr><td>T</td><td>T</td><td>H</td><td>T</td><td>U</td></tr> <tr><td></td><td>6</td><td>5</td><td>8</td><td>4</td></tr> <tr><td></td><td>5</td><td>8</td><td>4</td><td>8</td></tr> <tr><td></td><td colspan="4" style="text-align: right;">+</td></tr> <tr><td>1</td><td>2</td><td>4</td><td>3</td><td>2</td></tr> <tr><td>1</td><td>1</td><td>1</td><td></td><td></td></tr> </table> <p>Example 2: $1,034 + 586 = 2,620$</p> <table style="margin-left: 20px;"> <tr><td>T</td><td>T</td><td>H</td><td>T</td><td>U</td></tr> <tr><td></td><td>1</td><td>0</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td>5</td><td>8</td><td>6</td></tr> <tr><td></td><td colspan="4" style="text-align: right;">+</td></tr> <tr><td>2</td><td>6</td><td>2</td><td>0</td><td></td></tr> <tr><td>1</td><td>1</td><td>1</td><td></td><td></td></tr> </table> <p>Example 3: $£5.75 + £0.86 = £6.61$</p> <table style="margin-left: 20px;"> <tr><td>U</td><td>.</td><td>t</td><td>h</td></tr> <tr><td>£</td><td>5</td><td>.</td><td>75</td></tr> <tr><td>£</td><td>0</td><td>.</td><td>86</td></tr> <tr><td></td><td colspan="3" style="text-align: right;">+</td></tr> <tr><td>£</td><td>6</td><td>.</td><td>61</td></tr> <tr><td>1</td><td>1</td><td></td><td></td></tr> </table>		2	4		T	T	H	T	U		6	5	8	4		5	8	4	8		+				1	2	4	3	2	1	1	1			T	T	H	T	U		1	0	3	4			5	8	6		+				2	6	2	0		1	1	1			U	.	t	h	£	5	.	75	£	0	.	86		+			£	6	.	61	1	1			<p><u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Written compact method</u></p> <ul style="list-style-type: none"> • Add numbers with more than 4 digits using the formal written method of columnar addition • Include addition of numbers of different lengths eg. $234,897 + 45,996$ • Addition of decimals up to 3 decimal places and including mixed numbers of decimal places eg. $15.465 + 8.88$ • Include calculations that involve missing numbers and therefore use of inverse operations. Use column method to solve. eg. $3,254 + \square = 7,999$ • Ensure that columns are labelled and the addition sign is on the right-hand side <p>Example 1: $65,848 + 58,487 = 12,4335$</p> <table style="margin-left: 20px;"> <tr><td>H</td><td>T</td><td>H</td><td>T</td><td>H</td><td>T</td><td>U</td></tr> <tr><td></td><td>6</td><td>5</td><td>8</td><td>4</td><td>8</td><td></td></tr> <tr><td></td><td>5</td><td>8</td><td>4</td><td>8</td><td>7</td><td></td></tr> <tr><td></td><td colspan="6" style="text-align: right;">+</td></tr> <tr><td>1</td><td>2</td><td>4</td><td>3</td><td>3</td><td>5</td><td></td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td></td><td></td></tr> </table> <p>Example 2: $234,897 + 45,996 = 280,893$</p> <table style="margin-left: 20px;"> <tr><td>H</td><td>T</td><td>H</td><td>T</td><td>H</td><td>T</td><td>U</td></tr> <tr><td></td><td>2</td><td>3</td><td>4</td><td>8</td><td>9</td><td>7</td></tr> <tr><td></td><td></td><td>4</td><td>5</td><td>9</td><td>9</td><td>6</td></tr> <tr><td></td><td colspan="6" style="text-align: right;">+</td></tr> <tr><td>2</td><td>8</td><td>0</td><td>8</td><td>9</td><td>3</td><td></td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td></td><td></td></tr> </table> <p>Example 3: $15.465 + 8.88 = 24.345$</p> <table style="margin-left: 20px;"> <tr><td>T</td><td>U</td><td>.</td><td>t</td><td>h</td><td>th</td></tr> <tr><td>1</td><td>5</td><td>.</td><td>4</td><td>6</td><td>5</td></tr> <tr><td></td><td>8</td><td>.</td><td>8</td><td>8</td><td>0</td></tr> <tr><td></td><td colspan="5" style="text-align: right;">+</td></tr> <tr><td>2</td><td>4</td><td>.</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>1</td><td>1</td><td></td><td></td><td></td><td></td></tr> </table> <p style="margin-left: 100px;">← Place a zero here</p>	H	T	H	T	H	T	U		6	5	8	4	8			5	8	4	8	7			+						1	2	4	3	3	5		1	1	1	1	1			H	T	H	T	H	T	U		2	3	4	8	9	7			4	5	9	9	6		+						2	8	0	8	9	3		1	1	1	1	1			T	U	.	t	h	th	1	5	.	4	6	5		8	.	8	8	0		+					2	4	.	3	4	5	1	1					<p><u>+ = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.</p> <p><u>Written compact method</u></p> <ul style="list-style-type: none"> • See all examples from year 4 and 5. • Extend to numbers with any number of digits and decimal places up to 3 decimal places. • Incorporate reasoning style questions involving missing numbers and missing digits set out in a range of ways including columns and horizontally. <p><u>Set word problems such as this for the children to solve:</u></p> <p>Sammy wanted to buy a DVD player for £326.98 and a DVD box set for £49.50. How much money will she need? How much more will the DVD player cost?</p>
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ADDITION GUIDELINES – Mental Arithmetic

Year Four	Year Five	Year Six
<p><u>Mental</u></p> <p><u>Mental Fluency</u> Practise mental calculations to aid fluency.</p> <p><u>Add the nearest multiple of 10 or 100 and adjust</u> Secure mental methods model the method. e.g. $35 + 19$ is the same as $35 + 20 - 1$. Appropriate numbers e.g. $63 + 29$ is the same as $63 + 30 - 1$ eg. adding 9, 19, 21 ... to any two-digit number, adding 99, 199, 201... to a three digit-number.</p> <p><u>Add 1000 to any given number</u> Use understanding of place value eg $546 + 1000 = 1546$, $4578 + 1000 = 5578$, $24 + 1000 = 1024$. Answer questions such as, what is the missing number in the number sentence and how do you know? $5742 + \underline{\quad} = 9742$</p>	<p><u>Mental</u></p> <p><u>Mental Fluency</u> Practise mental calculations with increasingly large numbers to aid fluency.</p> <p>Children should be able to respond rapidly to oral or written questions, explaining the strategy used, e.g. 750 plus 255, add 400 to 1360, find the sum of 4500 and 1050, find the total of 3250 and 7600, 1800 more than 3300, increase 11 580 by 4000.</p> <p><u>Derive quickly related facts</u> e.g. $80 + 50 = 130$, $800 + 500 = 1300$</p> <p><u>Derive quickly number pairs that total 100 or pairs of multiples of 50 that total 1000</u> e.g. $32 + 68 = 100$ or $150 + 850 = 1000$</p> <p><u>Identify and use near doubles</u> e.g. work out $28 + 26 = 54$ by doubling 30 and subtracting first 2, then 4, or by doubling 26 and adding 2</p> <p><u>Add the nearest multiple of 10, 100 or 1000 and adjust</u> e.g. adding 9, 19, 21 ... to any two-digit number, adding 99, 199, 201... to a three digit-number, adding 999, 1999, 2001 from a four digit number.</p>	<p><u>Mental</u></p> <p><u>Mental Fluency</u> Perform mental calculations, including with mixed operations and large numbers to aid fluency.</p> <p>Present the children with problems such as:</p> <ul style="list-style-type: none"> • Taznim measured two lengths of material. One measured 3.45m and the other 2.65m. What is the total length? <p>Discuss mental calculation strategies that can be used to answer these, for example number facts and partitioning for addition.</p> <ul style="list-style-type: none"> • Louis poured 1998ml of water into one bucket and 2550ml into another. How much water did he have? <p>Discuss suitable mental calculation strategies, for example, rounding and adjusting for addition</p> <p>Teachers could decide on the mental calculation that they wish the children to rehearse, practice and then make up problems for them to answer. Common mental calculation strategies for addition include:</p> <ul style="list-style-type: none"> • Partitioning and recombining • Doubles and near doubles • Use number pairs to 10 and 100 • Adding near multiples of ten and adjusting – include decimals eg 0.9, 1.9, 2.9 etc... • Using patterns of similar calculations • Using known number facts • Bridging though ten, hundred, tenth etc...