

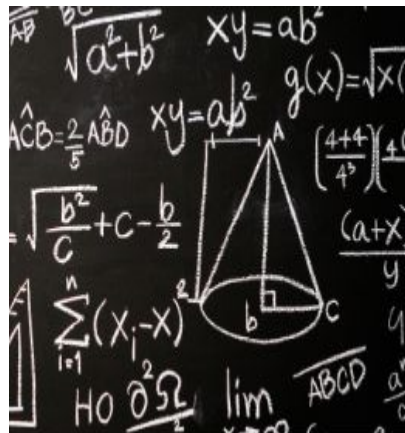
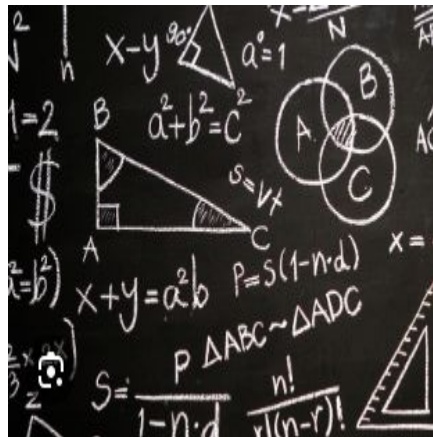


White Rose
MATHS

Primary maths

Calculation policy

Updated September 2024



Elmhurst Junior School has adopted the White Rose calculation policy to support pupils progression in mathematics across the Year groups.

Progression of skills - Addition

Year group	Skill
Year 2	<ul style="list-style-type: none">• Add 1s to any number (related facts)• Add three 1-digit numbers• Add across a 10• Add multiples of 10• Add 10s to any number• Add two 2-digit numbers (not across a ten)• Add two 2-digit numbers (across a ten)• Missing numbers
Year 3	<ul style="list-style-type: none">• Add 1s, 10s and 100s to a 3-digit number• Add two numbers (no exchange)• Add two numbers across a 10 or 100• Complements to 100• Add fractions with the same denominator within 1 whole• Calculate the duration of events

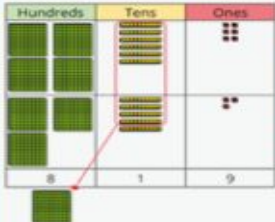

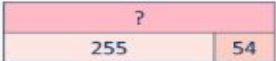
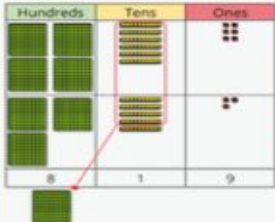


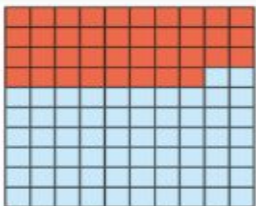

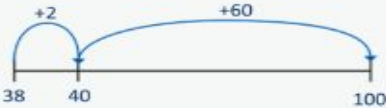
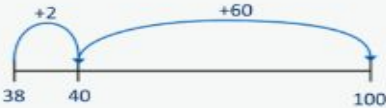
Progression of skills - Addition

Year group	Skill
Year 4	<ul style="list-style-type: none">• Add 1s, 10s and 100s to a 4-digit number• Add up to two 4-digit numbers• Add decimal numbers in the context of money• Add fractions and mixed numbers with the same denominator beyond 1 whole
Year 5	<ul style="list-style-type: none">• Add using mental strategies• Add whole numbers with more than 4 digits• Add decimals with up to 2 decimal places• Complements to 1• Add fractions with denominators that are a multiple of one another
Year 6	<ul style="list-style-type: none">• Add integers up to 10 million• Add decimals with up to 3 decimal places• Order of operations• Negative numbers• Add fractions



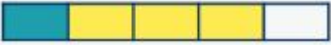
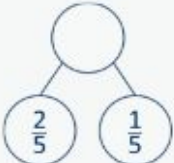



Addition

Year 3	<ul style="list-style-type: none">• Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds.• Add numbers with up to three digits, using formal written methods of columnar addition.• Add fractions with the same denominator within 1 whole.• Calculate the time taken by particular events or tasks.																										
Progression of skills	Key representations																										
Add 1s, 10s or 100s to a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	<p>The ones/tens/hundreds column will increase by ...</p> <div><table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr></table><p>444 + 5 = 444 + 50 = 444 + 500 =</p></div> <div><table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td></tr></table><p>777 + 2 = 777 + 20 = 777 + 200 =</p></div>	Hundreds	Tens	Ones				H	T	O				<p>What patterns do you notice?</p> <p>235 + 3 = 235 + 30 = 235 + 300 =</p> <p>111 + <input type="text"/> = 118 111 + <input type="text"/> = 181 111 + <input type="text"/> = 811</p>													
Hundreds	Tens	Ones																									
H	T	O																									
Add two numbers (no exchange) Mental strategies and introduction of formal written method.	<p>... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds</p> <div></div> <div><table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table></div> <div><table><tr><th colspan="2">?</th></tr><tr><td>345</td><td>432</td></tr></table> <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td>3</td><td>4</td><td>5</td></tr><tr><td>+</td><td>4</td><td>3</td></tr><tr><td colspan="3"><hr/></td></tr></table></div>		Hundreds	Tens	Ones							?		345	432	H	T	O	3	4	5	+	4	3	<hr/>		
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H	T	O																									
3	4	5																									
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Addition

Progression of skills	Key representations	
<p>Add two numbers across a 10 or 100</p> <p>Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.</p>	<p>There are ... ones, so I do/do not need to make an exchange. There are ... tens, so I do/do not need to make an exchange. ... ones = ... ten and ... ones. ... tens = ... hundred and ... tens.</p>      	
<p>Complements to 100</p> <p>Pairs of numbers which total 100</p>	<p>... plus ... is equal to 100</p>   	
		<p>I add ... to get to the next 10, then ... to get to 100</p>  <p> $38 + 62 = 100$ $62 + 38 = 100$ $100 = 38 + 62$ $100 = 62 + 38$ </p>



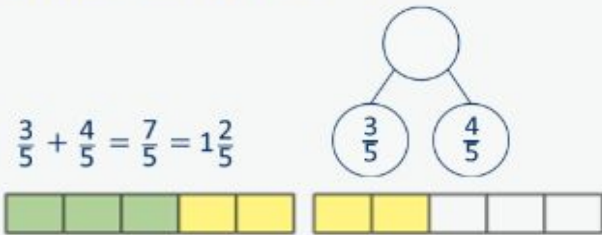
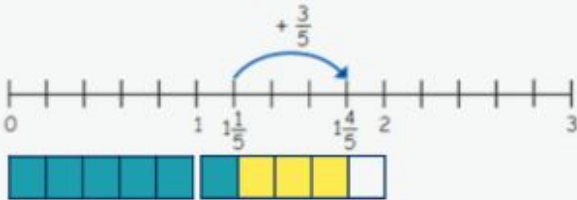
Addition

Progression of skills	Key representations
<p>Add fractions with the same denominator within 1 whole</p> <p>Make links with known facts.</p>	<p>When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths</p> <div>  $\frac{1}{5} + \frac{1}{5}$ </div> <div>  $\frac{1}{5} + \frac{2}{5}$ </div> <div>  $\frac{1}{5} + \frac{3}{5}$ </div> <div>  </div> <div>  </div>
<p>Calculate the duration of events</p> <p>Find durations of time between a given start and end point. Children will need to calculate complements to 60</p>	<p>From ... to ... o'clock is ... minutes. From ... o'clock to ... is ... minutes. The total time taken is ... minutes.</p> <div>  <div> <div>4:25</div>start <div>4:55</div>finish </div> </div> <div>  </div>

Addition

Year 4	<ul style="list-style-type: none">• Add numbers with up to 4 digits using a formal written method.• Solve simple measure and money problems involving fractions and decimals to 2 decimal places.• Add fractions with the same denominator.																																			
Progression of skills	Key representations																																			
Add 1s, 10s and 100s to a 4-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	<p>The ones/tens/hundreds/thousands column will increase by ...</p> <table><tr><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td><td></td></tr></table> <p>$3,425 + 3 =$ $3,425 + 300 =$ $3,425 + 30 =$ $3,425 + 3,000 =$</p>	Thousands	Hundreds	Tens	Ones					<p>What patterns do you notice?</p> <p>$2,350 + 3 =$ $2,350 + 30 =$ $2,350 + 300 =$ $2,350 + 3,000 =$</p> <p>$6,040 + 200 =$ $2,211 + \square = 2,251$ $6,040 + 500 =$ $2,211 + \square = 2,215$ $6,040 + 900 =$ $2,211 + \square = 2,511$</p>																										
Thousands	Hundreds	Tens	Ones																																	
Add up to two 4-digit numbers Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.	<p>There are ... ones/tens/hundreds so I do/do not need to make an exchange.</p> <p>I can exchange 10 ... for 1 ...</p> <div><table><tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td><td></td></tr></table><table><tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td>4</td><td>6</td><td>7</td><td>3</td></tr><tr><td>+</td><td>1</td><td>5</td><td>1</td><td>8</td></tr><tr><td colspan="4"><hr/></td></tr><tr><td>6</td><td>1</td><td>9</td><td>1</td></tr><tr><td>1</td><td></td><td></td><td></td></tr></table></div>			Th	H	T	O					Th	H	T	O	4	6	7	3	+	1	5	1	8	<hr/>				6	1	9	1	1			
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Addition

Progression of skills	Key representations	
<p>Add decimal numbers in the context of money</p> <p>Emphasis on partitioning and use of number lines rather than formal written calculations.</p>	<p>... pence + ... pence = ... pence ... pounds + ... pounds = ... pounds</p> <div>  </div> <p>45p + 25p = 70p £2 + £3 = £5 £5 + 70p = £5.70</p>	<p>£3.25 can be partitioned into £3 + 20p + 5p</p> <div>  </div>
<p>Add fractions and mixed numbers with the same denominator beyond 1 whole</p>	<p>When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths</p> <div>  </div> <div>  </div>	

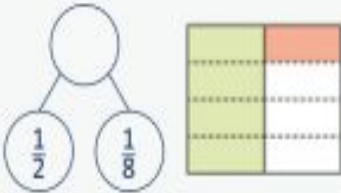

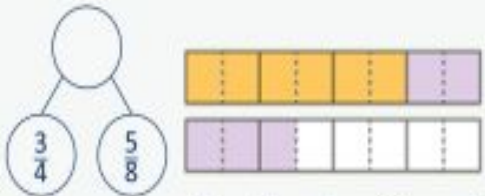
Addition

Year 5	<ul style="list-style-type: none">• Add whole numbers with more than 4 digits, including using formal written methods.• Add numbers mentally with increasingly large numbers.• Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1• Add fractions with the same denominator, and denominators that are multiples of the same number.																																																												
Progression of skills	Key representations																																																												
Add using mental strategies Add 1s, 10s, 100s, etc. to any number. Use number bonds and related facts.	<div><div><table><tr><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td>●●●●</td><td>●●●●●●●●</td><td>●●●●</td><td>●●●●</td><td></td></tr></table> $48,650 + 300 =$$48,650 + 30,000 =$$48,650 + 30 =$</div><div><p>To add ..., I can add ... then subtract ...</p><table><tr><td>?</td></tr><tr><td>6,458 99</td></tr></table> <p>6,458 6,557 6,558</p></div></div>	TTh	Th	H	T	O	●●●●	●●●●●●●●	●●●●	●●●●		?	6,458 99																																																
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6,458 99																																																													
Add whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	<p>I can exchange 10 ... for 1 ...</p> <div><table><tr><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td>●●</td><td>●●●●●●●●</td><td>●●●●</td><td>●●●●</td><td>●●</td></tr><tr><td>●●</td><td>●●●●●●●●</td><td>●●●●</td><td>●●●●</td><td>●●</td></tr></table> <table><tr><td>2</td><td>6</td><td>5</td><td>7</td><td>4</td></tr><tr><td>+</td><td>1</td><td>6</td><td>2</td><td>3</td></tr><tr><td colspan="5"><hr/></td></tr><tr><td>4</td><td>2</td><td>8</td><td>0</td><td>5</td></tr><tr><td>1</td><td>1</td><td></td><td></td><td></td></tr></table> <table><tr><td></td><td>4</td><td></td><td>1</td><td></td></tr><tr><td>+</td><td>2</td><td></td><td>8</td><td>4</td></tr><tr><td colspan="5"><hr/></td></tr><tr><td>8</td><td>9</td><td>9</td><td>2</td><td>6</td></tr></table></div>	TTh	Th	H	T	O	●●	●●●●●●●●	●●●●	●●●●	●●	●●	●●●●●●●●	●●●●	●●●●	●●	2	6	5	7	4	+	1	6	2	3	<hr/>					4	2	8	0	5	1	1					4		1		+	2		8	4	<hr/>					8	9	9	2	6
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Addition

Progression of skills	Key representations						
<p>Add decimals with up to 2 decimal places</p> <p>Progress from the same number of decimal places to a different number of decimal places, and from no exchange to exchange.</p>	<p>I do/do not need to make an exchange because ... I can exchange 10 ... for 1 ...</p> <div> </div> <div> </div>						
<p>Complements to 1</p> <p>Pairs of numbers with up to 3 decimal places which total 1</p> <p>Encourage children to make links with bonds to 10 and complements to 100 and 1,000</p>	<div> <p>$0.3 + \square = 1$ $0.35 + \square = 1$</p> </div> <div> </div> <div> </div> <div> <table border="0"> <tr> <td>$4 + 6 = 10$</td> <td>$0.4 + 0.6 = 1$</td> </tr> <tr> <td>$44 + 56 = 100$</td> <td>$0.44 + 0.56 = 1$</td> </tr> <tr> <td>$444 + 556 = 1,000$</td> <td>$0.444 + 0.556 = 1$</td> </tr> </table> </div>	$4 + 6 = 10$	$0.4 + 0.6 = 1$	$44 + 56 = 100$	$0.44 + 0.56 = 1$	$444 + 556 = 1,000$	$0.444 + 0.556 = 1$
$4 + 6 = 10$	$0.4 + 0.6 = 1$						
$44 + 56 = 100$	$0.44 + 0.56 = 1$						
$444 + 556 = 1,000$	$0.444 + 0.556 = 1$						

Addition

Progression of skills	Key representations
<p>Add fractions with denominators that are a multiple of one another</p> <p>Encourage children to convert fractions to the same denominator before adding.</p> <p>Progress from adding fractions within 1 whole to adding fractions beyond 1 whole.</p>	<p>The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent.</p> <div>  $\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$ </div> <div>  $\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$ </div> <div>  $\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$ </div>

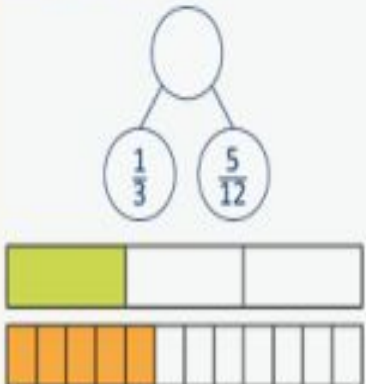
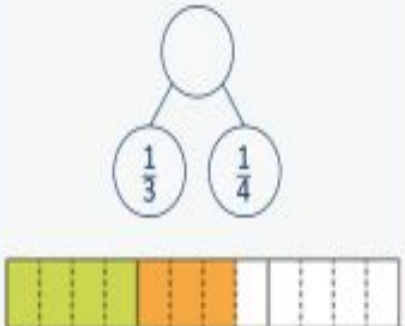
Addition

<p>Year 6</p>	<ul style="list-style-type: none">• Add larger numbers, using the formal written method of columnar addition.• Use their knowledge of the order of operations to carry out calculations involving the 4 operations.• Calculate intervals across zero.• Add fractions with different denominators and mixed numbers, using the concept of equivalent fractions.																																																																																						
<p>Progression of skills</p>	<p>Key representations</p>																																																																																						
<p>Add integers up to 10 million</p> <p>Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<div><table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>3</td><td>4</td><td>6</td><td>2</td><td>2</td><td>1</td></tr><tr><td></td><td>+</td><td>1</td><td>8</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td></td><td></td><td>5</td><td>3</td><td>0</td><td>5</td><td>4</td><td>2</td></tr><tr><td></td><td></td><td>1</td><td>1</td><td></td><td></td><td></td><td></td></tr></table></div> <div><table><tr><td colspan="3">?</td></tr><tr><td>2,354</td><td>750</td><td>1,500</td></tr></table></div> <div><table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>8</td><td>1</td><td></td><td>8</td><td>5</td><td></td></tr><tr><td></td><td>+</td><td></td><td></td><td>0</td><td>6</td><td></td><td></td></tr><tr><td></td><td></td><td>9</td><td>9</td><td>5</td><td></td><td>8</td><td></td></tr></table></div>											3	4	6	2	2	1		+	1	8	4	3	2	1			5	3	0	5	4	2			1	1					?			2,354	750	1,500											8	1		8	5			+			0	6					9	9	5		8									
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<p>Add decimals with up to 3 decimal places</p> <p>Progress to numbers with digits in different place value columns.</p> <p>Encourage children to check that they have lined up the columns correctly.</p>	<p>I do/do not need to make an exchange because ...</p> <div><table><tr><th>O</th><th>Tth</th><th>Hth</th><th>Thth</th></tr><tr><td>●●●</td><td>●</td><td></td><td>●●●●●●●●</td></tr><tr><td>●●●</td><td>●</td><td>●●●●●</td><td>●●●●●●●●</td></tr><tr><td>5</td><td>2</td><td>6</td><td>2</td></tr></table></div> <div><table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>3</td><td>1</td><td>0</td><td>8</td></tr><tr><td></td><td>+</td><td>2</td><td>1</td><td>5</td><td>4</td></tr><tr><td></td><td></td><td>5</td><td>2</td><td>6</td><td>2</td></tr><tr><td></td><td></td><td></td><td></td><td>1</td><td></td></tr></table></div> <div><table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>1</td><td>5</td><td>0</td><td>2</td><td>7</td><td></td></tr><tr><td></td><td>+</td><td></td><td>9</td><td>5</td><td>8</td><td></td><td></td></tr><tr><td></td><td></td><td>2</td><td>4</td><td>6</td><td>0</td><td>7</td><td></td></tr><tr><td></td><td></td><td>1</td><td></td><td>1</td><td></td><td></td><td></td></tr></table></div>	O	Tth	Hth	Thth	●●●	●		●●●●●●●●	●●●	●	●●●●●	●●●●●●●●	5	2	6	2									3	1	0	8		+	2	1	5	4			5	2	6	2					1												1	5	0	2	7			+		9	5	8					2	4	6	0	7				1		1			
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Addition

Progression of skills	Key representations
<p>Order of operations</p> <p>Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction. *When no brackets are shown and the operations have the same priority, work left to right.</p>	<p>... has greater priority than ..., so the first part of the calculation I need to do is ...</p> <div> <p>A triangle divided into four horizontal sections. From top to bottom: a yellow section with '()', an orange section with 'powers', a purple section with '× and ÷', and a green section with '+ and -'.</p> </div> <div> <p>Two groups of five teal dots each, representing (3 + 4) x 2 = 14.</p> </div> <div> <p>Three teal dots and two groups of two teal dots each, representing 3 + 4 x 2 = 11.</p> <p> <p>Three groups of two teal dots each and two teal dots, representing 3 x 4 + 2 = 14.</p> </p> </div>
<p>Negative numbers</p> <p>Children add to negative numbers and carry out calculations which cross 0</p>	<div> <p>... plus ... is equal to ...</p> <p>$-3 + 5 = 2$</p> <p>A number line from -5 to 5. A teal arrow starts at -3 and jumps to -2, then to -1, then to 0, and finally to 2. The final position is 2.</p> </div> <div> <p>$-11 + 16 = 5$</p> <p>A number line from -11 to 5. A teal arrow starts at -11 and jumps to 0, labeled '+11'. A second teal arrow starts at 0 and jumps to 5, labeled '+5'.</p> </div> <div> <p>A number line from -5 to 5. Four teal arcs connect -5 to -4, -4 to -3, -3 to -2, and -2 to -1. The total distance is 4 units.</p> <p>The difference between -5 and -1 is 4</p> <p>A number line from -5 to 5. Two teal arcs connect -5 to 0, labeled '+5', and 0 to 5, labeled '+5'. The total distance is 10 units.</p> <p>The difference between -5 and 5 is 10</p> </div>

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Progression of skills	Key representations		
<p>Add fractions</p> <p>Convert fractions to the same denominator before adding. Progress from fractions where one denominator is a multiple of the other, to any fractions and then to mixed numbers.</p>	<p>The denominator has been multiplied by ..., so the numerator needs to be multiplied by ...</p> 	<p>The lowest common multiple of ... and ... is ...</p>  $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$	<p>...is made up of ... wholes and ...</p> 