
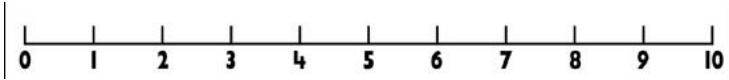


**CALCULATION POLICY: ADDITION**

The policy gives an outline of the small steps of progression matched to the expectations for each year group according to the new 2014 National Curriculum. Some examples are included and further ones can be added to your document.

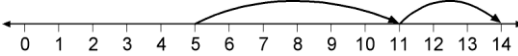
Concrete objects as models, such as cubes, counters, Dienes blocks, Cuisenaire rods and Numicon need to be used to help children gain conceptual understanding, supported by images such as number lines and 100 squares to develop mental pictures as a step from counting to calculation. Fluency in mental strategies and quick recall of facts need to be established before using a formal written method, but informal jottings and a recorded mental method can help bridge the mental and written methods so that each stage of the chosen written method is understood.

**Year 1**

Addition steps	Example
Count on a number line to add	<p>What is the number after 9? Show me on this number line.</p> 
Develop quick recall of addition facts to 5, using the symbols + and =	<p><math>2 + 3 = \underline{\quad}</math>                      <math>2 + 1 = \underline{\quad}</math>                      <math>3 + 1 = \underline{\quad}</math></p>
Use strategy of holding the first number in the head and counting on to add	<p>What is 4 add 3?</p> <p>Show me on this number line how you hold the 4 in your head and count on.</p> 
Understand the commutative law for addition	<p>What can you tell me about <math>3 + 4</math> and <math>4 + 3</math>? Show me with these rods.</p>

Know the number bonds that total 10	$0+10$ $1+9$ $2+8$ $3+7$ $4+6$ $5+5$
Develop quick recall of addition facts to 10	$5 + 3 = \underline{\quad}$ $2 + 7 = \underline{\quad}$ $6 + 4 = \underline{\quad}$
Use doubles and near-doubles for addition facts to 10	<i>How can <math>4 + 4 = 8</math> help you work out <math>4 + 5</math>?</i>
Calculate the value of a missing number in an addition to 10	$3 + \underline{\quad} = 7$ $\underline{\quad} + 4 = 9$ $5 + 5 = \underline{\quad}$
Produce number stories involving addition to 10	<i>Use five toy cars and a garage to make different number stories like this: One car is in the garage and four cars are outside, which is five altogether. One added to four makes five.</i>
Say a number that is one more than any number to 20	<i>There are twelve counters in the pot. How many will there be if I put in one more?</i>
Know the number bonds that total 20	<i>How many different pairs of numbers can you remember that have a total of 20? How can you be sure you have got them all?</i>
Use doubles and near-doubles for addition facts to 20	<i>If you know that 6 add 6 equals 12, how can this help you work out 6 add 7?</i>
Develop quick recall of addition facts to 20	$7 + 6 = \underline{\quad}$ $4 + 8 = \underline{\quad}$ $9 + 5 = \underline{\quad}$
Calculate the value of a missing number in an addition to 20	$7 + \underline{\quad} = 15$ $\underline{\quad} + 4 = 12$ $11 + 5 = \underline{\quad}$

## Year 2

Addition steps	Example
Produce number stories involving addition to 20	<p>Look at this number sentence: <math>\square + \square = 20</math></p> <p>What could the missing numbers be?</p> <p>Make up a story for your missing numbers.</p>
Add three or more numbers	<p>Look at the number line. It shows the sum that Jasmine did.</p>  <p>Which of these sums did Jasmine do?</p> <p><math>5 + 7 + 2 = 14</math>                      <math>5 + 6 + 3 = 14</math></p> <p><math>5 + 5 + 4 = 14</math>                      <math>5 + 8 + 1 = 14</math></p> <p>Find the missing number: <math>10 + \square + 25 = 55</math></p>
Recall addition facts for multiples of 10 to 90	I think of a number and add 30. The answer is 70. What is my number?
Add tens and units together and relate to place value	Show me $30 + 7$ using the Dienes material
Use mental strategies for TU + U without crossing the tens	<p>Explain how you worked these out:</p> <p><math>24 + 5 = \underline{\quad}</math>                      <math>36 + 3 = \underline{\quad}</math></p>
Use mental strategies for TU + U up to and then crossing the tens	What is $17 + 8$ ? What number facts might you use to help you work this out? How could you show that on a number line?

<p>Use mental strategies for TU + T up to 100</p>	<p><i>What is 37 + 50? How did you work this out? Could you write something or use apparatus to help you explain?</i></p>												
<p>Use mental strategies for TU + T over 100</p>	<p><i>Show me how to find the total of 79p and 50p.</i></p>												
<p>Use mental strategies for TU + TU up to 100</p>	<p><i>How do you work out 35 + 24? What about 46 + 28?</i></p>												
<p>Use mental strategies for TU + TU over 100</p>	<p><i>Show me how you worked out 15 more than 85.</i></p>												
<p>Calculate the value of a missing number in a mental addition</p>	<p><i>What number goes in the box to make this calculation correct? <math>\square + 12 = 27</math> How do you know?</i></p>												
<p>Use a formal written method for TU+TU</p>	<p><i>Example 1</i></p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center; width: 33%;"><math display="block">\begin{array}{r} 54 \\ + 33 \\ \hline 87 \end{array}</math></td> <td style="text-align: center; width: 33%;"><math display="block">\begin{array}{r} 54 \\ + 33 \\ \hline 7 \end{array}</math></td> <td style="text-align: center; width: 33%;"><math display="block">\begin{array}{r} 54 \\ + 33 \\ \hline 87 \end{array}</math></td> </tr> </table> <p style="margin-left: 100px;"><i>1. Add the ones 4+3 = 7</i></p> <p style="margin-left: 100px;"><i>2. Add the tens 50+30 = 80</i></p> <p><i>Example 2</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><math>28 + 35</math></td> <td style="width: 33%; text-align: center;"><math>\rightarrow</math></td> <td style="width: 33%;"> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><math>20 + 8</math></td> <td style="text-align: center;"><math>8 + 5 = 13</math></td> </tr> <tr> <td style="text-align: center;"><math>+ 30 + 5</math></td> <td style="text-align: center;"><math>20 + 30 = 50</math></td> </tr> <tr> <td style="text-align: center;"><math>\hline 50 + 13</math></td> <td style="text-align: center;"><b><math>50 + 13 = 63</math></b></td> </tr> </table> </td> </tr> </table>	$\begin{array}{r} 54 \\ + 33 \\ \hline 87 \end{array}$	$\begin{array}{r} 54 \\ + 33 \\ \hline 7 \end{array}$	$\begin{array}{r} 54 \\ + 33 \\ \hline 87 \end{array}$	$28 + 35$	$\rightarrow$	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><math>20 + 8</math></td> <td style="text-align: center;"><math>8 + 5 = 13</math></td> </tr> <tr> <td style="text-align: center;"><math>+ 30 + 5</math></td> <td style="text-align: center;"><math>20 + 30 = 50</math></td> </tr> <tr> <td style="text-align: center;"><math>\hline 50 + 13</math></td> <td style="text-align: center;"><b><math>50 + 13 = 63</math></b></td> </tr> </table>	$20 + 8$	$8 + 5 = 13$	$+ 30 + 5$	$20 + 30 = 50$	$\hline 50 + 13$	<b><math>50 + 13 = 63</math></b>
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Year 3

Addition steps	Example
<p>Use mental strategies to add ones, tens and hundreds to a 3-digit number</p>	<p><i>What is 268 add 50? How did you work it out?</i></p>
<p>Use a formal written method for HTU+TU</p>	<p><i>What is 348 add 79?</i></p> $  \begin{array}{r}  348 \\  + \quad 79 \\  \hline  427 \\  \small{1 \quad 1}  \end{array}  $ <p><i>Step 1</i>  <math>8+9=17</math></p> <p><i>Step 2</i>  <math>10+40+70 = 120</math></p> <p><i>Step 3</i>  <math>100+300 = 400</math></p> <p><i>Partition 17 into 10 and 7. Write the 7 in the ones column and write the 1 ten under the tens column.</i></p> <p><i>Partition 120 into 100 and 20. Write 2 tens in the tens column and write the 1 hundred under the hundreds column.</i></p> <p><i>Write the 6 hundreds in the hundreds column</i></p>
<p>Use a formal written method for HTU+HTU</p>	<p><i>What is 348 added to 279?</i></p> $  \begin{array}{r}  348 \\  + \quad 279 \\  \hline  627 \\  \small{1 \quad 1}  \end{array}  $ <p><i>Step 1</i>  <math>8+9=17</math></p> <p><i>Step 2</i>  <math>10+40+70 = 120</math></p> <p><i>Step 3</i>  <math>100+300+200=600</math></p>

Use a formal written method for adding 4-digit numbers	<p><i>What is 6879 add 1905?</i></p> $\begin{array}{r} 6859 \\ + 1905 \\ \hline 8764 \\ \small{1 \quad 1} \end{array}$
Use a formal written method to add money using decimal notation to tenths	<p><i>What is the total of £16.40 and £23.90?</i></p> $\begin{array}{r} £16.40 \\ + £23.90 \\ \hline £40.30 \\ \small{1 \quad 1} \end{array}$

## Year 4

Addition steps	Example
Use a formal written method to add units of measure using decimal notation to tenths	<p>What is the total weight of two crates weighing 345.6 kg and 297.8 kg?</p> $\begin{array}{r} 345.6 \text{ kg} \\ + 297.8 \text{ kg} \\ \hline 643.4 \text{ kg} \\ \phantom{0}1 \phantom{0}1 \phantom{0}1 \end{array}$
Use a formal written method to add money using decimal notation to hundredths	<p>What is the total of £16.49 and £23.96?</p> $\begin{array}{r} £16.49 \\ + £23.96 \\ \hline £40.45 \\ \phantom{0}1 \phantom{0}1 \phantom{0}1 \end{array}$
Use a formal written method to add units of measure using decimal notation to hundredths	<p>What is 56.89 m added to 38.75 m?</p> $\begin{array}{r} 56.89 \text{ m} \\ + 38.75 \text{ m} \\ \hline 95.64 \text{ m} \\ \phantom{0}1 \phantom{0}1 \phantom{0}1 \end{array}$

## Year 5

Addition steps	Example
Use a formal written method to add larger numbers	<p><i>What is 6879 add 1905?</i></p> $\begin{array}{r} 6859 \\ + 1905 \\ \hline 8764 \\ \hline \end{array}$
Add numbers mentally with increasingly large numbers	<p><i>How do you work out 2380 + 600? What about 4009 + 75?</i></p>
Add fractions with the same denominator	<p><i>What is <math>\frac{3}{8} + \frac{3}{8}</math>? Can you write the fraction in a different way?</i></p>
Use a formal written method to add decimals to thousandths	<p><i>What is 56.893 kg added to 38.755 kg?</i></p> $\begin{array}{r} 56.893 \text{ kg} \\ + 38.755 \text{ kg} \\ \hline 95.648 \text{ kg} \\ \hline \end{array}$



## Year 6

Addition steps	Example
Use brackets in calculations and know the order of operations	<i>Answer these:</i> $(15 + 8) \times (12 - 6) =$ $(9 + 15) - (3 \times 2) =$
Add fractions with different denominators	<i>What is <math>3/5 + 2/3</math>? Explain the method you used to work it out.</i>