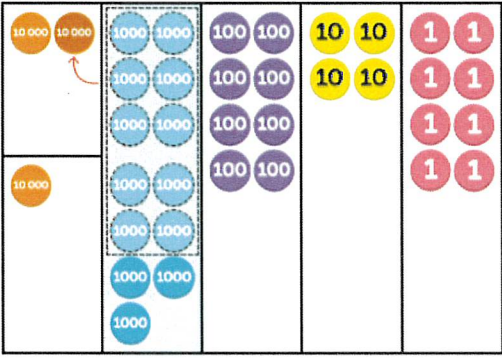
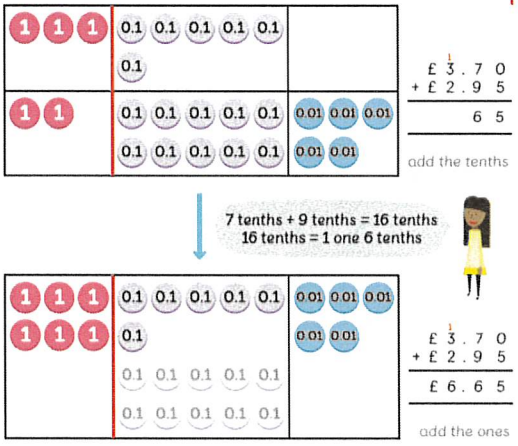




## Boothferry Primary School Calculation Policy

NC Objective, Strategy & Key Vocabulary	Concrete	Pictorial	Abstract
<p>1. Column addition with numbers with more than 4 digits.  <b>Hundred thousands, ten thousands, thousands, hundreds, tens, ones, add, plus, addends, total, sum</b>  <b>Add whole numbers with more than 4 digits, including using a formal written method (columnar addition).</b></p>	<p>16,603 + 17,245</p> 	<p>Children can draw their own place value chart and circles to represent counters.</p>	<p>Children should be familiar with exchanging and renaming in more than 1 place value column from their calculation learning in Y3&amp;4.</p> $\begin{array}{r} 16603 \\ + 17245 \\ \hline 3848 \end{array}$ <p style="text-align: center; margin-left: 100px;">1</p> <p>Extend this with numbers which have up to 6 or 7 digits, exchanging in 1 column before multiple columns.</p> $\begin{array}{r} 81,059 \\ 3,668 \\ 15,301 \\ + 20,551 \\ \hline 120,579 \end{array}$ <p>Then add several numbers of increasing complexity.</p>
<p>2. Column addition with numbers with decimal places.  <b>Decimal point, tenths, hundredths, thousandths</b>  <b>Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation.</b></p>	<p>Once children are confident adding decimal numbers, apply learning to the context of measures inc. money.</p> 	<p>Children can draw their own place value chart and circles to represent counters.</p>	<p>Decimal points do <b>not</b> need a place value column and carries should still be placed <b>underneath</b> where the total is being calculated.</p> $\begin{array}{r} 2.66 \\ + 2.58 \\ \hline 5.24 \end{array}$ <p style="text-align: center; margin-left: 100px;">1 1</p> <p>When adding numbers with different numbers of place value columns, <b>align the decimal points</b> then add zeros as place holders.</p> $\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \end{array}$

# Y5-6 ADDITION



## Boothferry Primary School Calculation Policy

<p>3. Estimation and inverse</p> <p style="color: red;">Estimate, round, approximate, inverse, opposite</p> <p><b>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</b></p>	<p><i>See Y5 subtraction for use of place value counters to check using inverse.</i></p>	<p><b>Inverse:</b> Use bar models to show the relationship between the numbers in any calculation.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; text-align: center; padding: 2px;">28913</td> <td style="border: 1px solid black; width: 20px;"></td> <td style="border: 1px solid black; text-align: center; padding: 2px;">5396</td> </tr> <tr> <td style="border: 1px solid black; text-align: center; padding: 2px;">23517</td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> </tr> </table> </div> <p> <math>23517 + 5396 = 28913</math>      <math>5396 + 23517 = 28913</math>  <math>28913 - 23517 = 5396</math>      <math>28913 - 5396 = 23517</math> </p> <p><i>Children should draw their own bars and understand that the placement of the dividing line between the bars is relative to the place value of the numbers. Each bar = 1 square deep in maths books.</i></p>	28913		5396	23517			<p><b>Inverse:</b> see Y5 subtraction for using column subtraction to check calculations identified using the bar model.</p> <p><b>Estimation:</b> throughout addition, children should be taught to estimate to predict/ check their answers.</p> <p>Eg. <math>23517 + 5396 = 28913</math>  Rounded to the nearest 1000s:  <math>24000 + 5000 = 29000</math></p> <p><i>Building on work in place value, discuss when to round to the nearest 1000/100/10.</i></p>
28913		5396							
23517									

**Notes and guidance (non-statutory)**

Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency (see [Mathematics Appendix 1](#)).

They practise mental calculations with increasingly large numbers to aid fluency (for example,  $12\ 462 - 2300 = 10\ 162$ ).

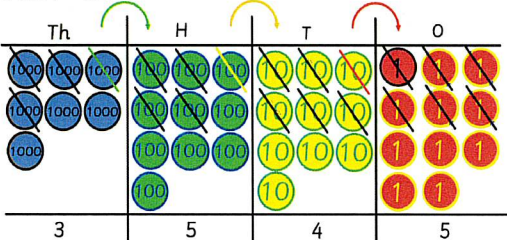
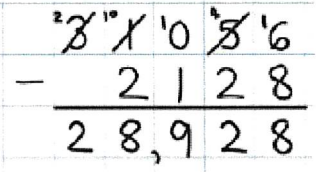
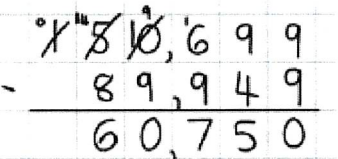
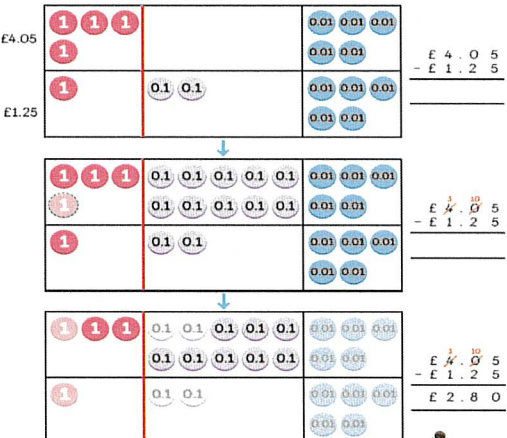

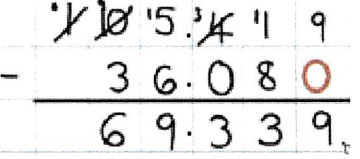
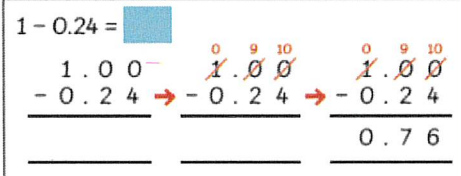
Only addition example in NC appendix 1:

$$\begin{array}{r}
 7\ 8\ 9 \\
 +\ 6\ 4\ 2 \\
 \hline
 1\ 4\ 3\ 1 \\
 \hline
 1\ 1
 \end{array}$$



## Boothferry Primary School Calculation Policy

# Y5-6 SUBTRACTION

NC Objective, Strategy & Key Vocabulary	Concrete	Pictorial	Abstract
<p>1.Column subtraction with numbers with more than 4 digits.  <b>Hundred thousands, ten thousands, thousands, hundreds, tens, ones, add, plus, addends, total, sum</b>  <b>Subtract whole numbers with more than 4 digits, including using a formal written method (columnar subtraction).</b></p>	<p>As Y4, with further columns following the same process:  <math>7001 - 3456 =</math></p>  <ol style="list-style-type: none"> <li>Can't take 6 ones from 1 one: take 1 thousand and make 10 hundreds.</li> <li>Take 1 hundred and make 10 tens.</li> <li>Take 1 ten and make 10 ones.</li> <li>11 - 6, 9 - 5, 9 - 4, 6 - 3</li> </ol>	<p>Children can draw their own place value chart and circles to represent counters.</p>	<p>Children should be familiar with exchanging and renaming in more than 1 place value column from their calculation learning in Y3&amp;4.</p>  <p>Extend this with numbers which have up to 6 or 7 digits, exchanging in 1 column before multiple columns.</p> 
<p>2.Column subtraction with numbers with decimal places.  <b>Decimal point, tenths, hundredths, thousandths</b>  <b>Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation.</b></p>	<p>Once children are confident adding decimal numbers, apply learning to the context of measures inc. money.</p>  <p>The price difference is £2.80.</p> 	<p>Children can draw their own place value chart and circles to represent counters.</p>	<p>Decimal points do <b>not</b> need a place value column. When subtracting numbers with different numbers of place value columns, <b>align the decimal points</b> then add zeros as place holders.</p>  



## Boothferry Primary School Calculation Policy

<p>3. Estimation and inverse</p> <p>Estimate, round, approximate, inverse, opposite</p> <p>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</p>	<p><i>See Y5 addition for use of place value counters to check using inverse.</i></p>	<p><b>Inverse:</b> Use bar models to show the relationship between the numbers in any calculation.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">28913</td> </tr> <tr> <td style="text-align: center;">23517</td> <td style="text-align: center;">5396</td> </tr> </table> <p>23517 + 5396 = 28913      5396 + 23517 = 28913                  28913 - 23517 = 5396      28913 - 5396 = 23517</p> <p><i>Children should draw their own bars and understand that the placement of the dividing line between the bars is relative to the place value of the numbers. Each bar = 1 square deep in maths books.</i></p>	28913		23517	5396	<p><b>Inverse:</b> see Y5 addition for using column addition to check calculations identified using the bar model.</p> <p><b>Estimation:</b> throughout subtraction, children should be taught to estimate to predict/ check their answers.</p> <p>Eg. 23517 - 5396 = 18121                  Rounded to the nearest 1000s:                  24000 - 5000 = 19000</p> <p><i>Building on work in place value, discuss when to round to the nearest 1000/100/10.</i></p>
28913							
23517	5396						

**Notes and guidance (non-statutory)**

Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency (see [Mathematics Appendix 1](#)).

They practise mental calculations with increasingly large numbers to aid fluency (for example, 12 462 - 2300 = 10 162).

NC appendix 1:

8	12	1	8	12	1
8	7	4	9	3	2
-	5	2	-	4	5
3	5	1	4	7	5





# Boothferry Primary School Calculation Policy



Multiplying decimals  
**Ones, decimal point, tenths, hundredths**  
 Multiply one-digit numbers with up to two decimal places by whole numbers.

$4.25 \times 3 =$

Multiply the hundredths.

15 hundredths = 1 tenth + 5 hundredths

Children can draw their own place value counters if necessary.

Remind children that the **single digit** belongs in the ones column and that the decimal points **must** be aligned.

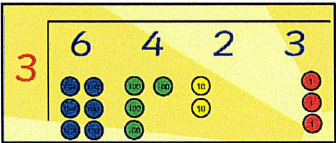
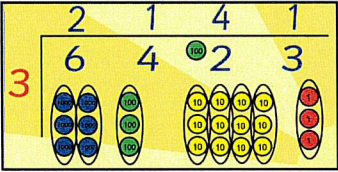
above →

$$\begin{array}{r} 2 \quad 2 \quad 3 \\ 0.23 \\ \times 9 \\ \hline 2.07 \end{array}$$

# Y6 MULTIPLICATION



## Boothferry Primary School Calculation Policy

Strategy <b>Key Vocabulary</b> <b>NC objective</b>	Concrete	Pictorial	Abstract																														
<p>1. Mental division</p> <p><b>Divided by, hundreds, tens, ones, tenths, hundredths</b></p>	<p>Divide by 10, 100 and 1000 using dienes alongside place value charts and building on learning from Y5 about using known facts, eg. using <math>144 \div 12 = 12</math> to work out <math>1400 \div 12 = 120</math></p>	<p>Children can draw their own place value charts to aid <math>\times</math> and <math>\div</math> 10 and 100:</p> <table border="1" style="margin: 10px auto; text-align: center;"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> <th>t</th> <th>h</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>5</td> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td></td> <td>4</td> <td>5</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>4</td> <td>5</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>4</td> <td>5</td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">← x ÷ →</p>	Th	H	T	O	t	h	4	5	0	0				4	5	0					4	5						4	5		<p><math>3200 \div 80 =</math></p> <p><math>270 \div \underline{\quad} = 2.7</math></p> <p>A number divided by 1000 is 3.15. What is the number?</p>
Th	H	T	O	t	h																												
4	5	0	0																														
	4	5	0																														
		4	5																														
			4	5																													
<p>2. Short division</p> <p><b>Divide numbers up to 4 digits by a two-digit number using the formal written method of short division.</b></p> <p><b>Regroup, remainder</b></p>	<p>Children to use place value counters to practise regrouping. Eg. Regrouping 1 hundreds counter for 10 tens counters.</p> <div style="text-align: center;">  <p style="margin-left: 100px;"><math>6423 \div 3 =</math></p> </div> <div style="text-align: center; margin-top: 20px;">  </div>	<p>Children can draw their own place value counters alongside written 'bus stop' (short division) calculation methods.</p>	<p>First, practise divisions which only require regrouping in one column, before multiple columns ....</p> <p>...then calculations with remainders:</p> <div style="text-align: center; margin: 10px 0;"> <math display="block">\begin{array}{r} 8 \quad 6 \quad r2 \\ 5 \overline{) 432} \end{array}</math> </div> <p>Word problems with remainders:</p> <p>Amira packs 1456 beads into small bags of 14 beads each. How many bags of beads does she get?</p>																														

# Y6 DIVISION



# Boothferry Primary School Calculation Policy



3. Long division  
 Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division.

Children may need to present remainders as decimals or fractions dependent on the context of the problem. Decimal remainders are common in measurement, inc. money, problems.

Divisions with remainders:

$$\begin{array}{r}
 28 \text{ r } 12 \\
 15 \overline{) 432} \\
 \underline{300} \\
 132 \\
 \underline{120} \\
 12
 \end{array}$$

Divisions with remainders as decimals:

$$\begin{array}{r}
 28.8 \\
 15 \overline{) 432.0} \\
 \underline{300} \quad \downarrow \\
 132 \quad \downarrow \\
 \underline{120} \quad \downarrow \\
 120 \\
 \underline{120} \\
 0
 \end{array}$$

# Y6 DIVISION