

Calculation Policy for Year 4, 5 and 6

Year 4

Addition

Adding numbers with up to 4 digits.

Again this should start with the children using dienes to support them with lots of discussion about the value of each digit.

2	3	1	4	
+	4	2	4	0
6	5	5	4	

Step 1

Step 2

Step 3

Step 4

Add the ones.
4 ones + 0 ones = 4 ones

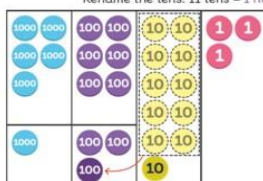
Add the tens.
1 ten + 4 tens = 5 tens

Add the hundreds.
3 hundreds + 2 hundreds = 5 hundreds

Add the thousands.
2 thousands + 4 thousands = 6 thousands


$2314 + 4240 = 6554$

Step 2 Add the tens. 7 tens + 3 tens + 1 ten = 11 tens
Rename the tens. 11 tens = 1 hundred and 1 ten



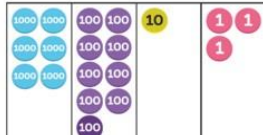
5	6	7	8
+	1	2	3
6	8	9	1

Step 3 Add the hundreds.
6 hundreds + 2 hundreds + 1 hundred = 9 hundreds



5	6	7	8
+	1	2	3
9	1	3	5

Step 4 Add the thousands.
5 thousands + 1 thousand = 6 thousands



5	6	7	8
+	1	2	3
6	9	1	3

Using the bar to find missing digits.

It is important for children to use the bar in this way to encourage the use of it to aid with problem solving.

This is not a form of getting the correct answer but helping to guide children to the correct operation.

Alison jogs 6,860 metres and Calvin jogs 5,470 metres. How far do they jog altogether?



Subtraction

To subtract with numbers up to four digits including exchanging when children are secure.

Again children need to use dienes to support their learning.

3	4	3	7	
-	2	0	1	6
1	4	2	1	

Step 1

Step 2

Step 3

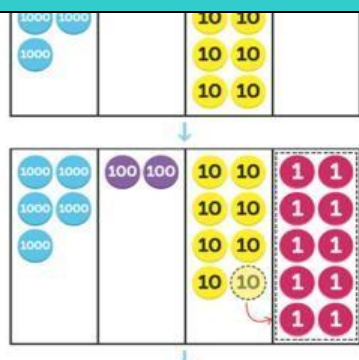
Step 4


Subtract the ones.
7 ones - 6 ones = 1 one

Subtract the tens.
3 tens - 1 ten = 2 tens

Subtract the hundreds.
4 hundreds - 0 hundreds = 4 hundreds

Subtract the thousands.
3 thousands - 2 thousands = 1 thousand





5	2	8	0
-	3	1	6
2	1	7	4

Using the bar to find missing digits.

It is important for children to use the bar in this way to encourage the use of it to aid with problem solving.

315	$315 - 185 = ?$
185 ?	$185 + ? = 315$
?	$185 + 315 = ?$
185 315	$? - 185 = 315$

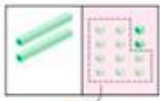
Multiplication

Children to know all times tables to 12 x 12.


Ladder method to be used with children multiplying both two and three digits by a one digit number.

Let's Learn

1 There are 4 groups of 23 fish. How do we multiply 23 by 4?




4 ones \times 3 = 12 ones
12 ones = 1 ten 2 ones



Step 1 Multiply the ones by 4.

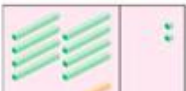
	t	o
	2	3
\times		4
	1	2



2 tens \times 4 = 8 tens

Step 2 Multiply the tens by 4.

	t	o
	2	3
\times		4
	1	2
	8	0



12 + 80 = 92

Step 3 Add the products.

	t	o
	2	3
\times		4
	1	2
$+$	8	0
	9	2

$23 \times 4 = 92$

There are 92 fish in 4 tanks.

Multiplying using the bar.

A computer costs 5 times as much as a television. The television costs £429.

Cost of the computer

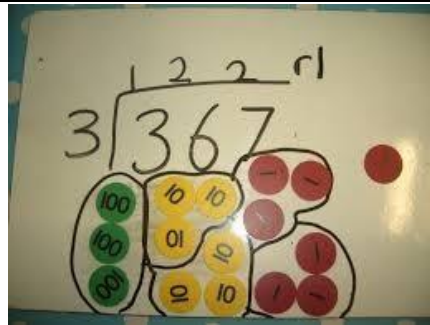
How much does the computer cost?

?				
£429				

Division

Dividing up to three digit numbers by a one digit number using short division.

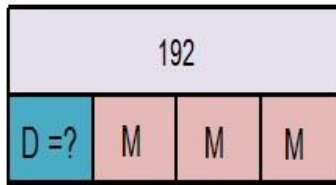
Only when the children are secure with dividing a two digit number should they move onto a 3 digit number.



	H	T	U	
	0	2	5	r1
5	1	2	6	
		•••••	•••••	•

Dividing using the bar.

Desmond and Melissa collect cards. They have 192 cards in all. Melissa has three times as many cards as Desmond. How many cards does Desmond have?



Year 5

Addition

Adding numbers with more than 4 digits including decimals

Using place value charts are key to this as well as place value counters to help with the decimals.

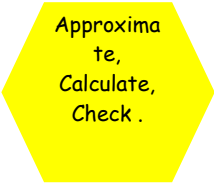
$$\begin{array}{r}
 \text{£ } 23.59 \\
 + \text{£ } 7.55 \\
 \hline
 \text{£ } 31.14
 \end{array}$$

$$\begin{array}{r}
 23481 \\
 + 1362 \\
 \hline
 24843
 \end{array}$$

$$\begin{array}{r}
 19.01 \\
 3.65 \\
 + 0.7 \\
 \hline
 23.36
 \end{array}$$

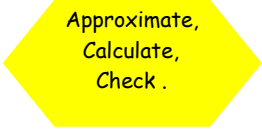
<p>Using the bar to find missing digits.</p> <p><i>It is important for children to use the bar in this way to encourage the use of it to aid with problem solving.</i></p>	<p>This is not a form of getting the correct answer but helping to guide children to the correct operation.</p> <p>MacDonalds sold £9957.68 worth of hamburgers and £1238.5 worth of chicken nuggets. How much money did they take altogether?</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td colspan="2" style="text-align: center;">?</td> </tr> <tr> <td style="text-align: center;">£957.68</td> <td style="text-align: center;">£1238.5</td> </tr> </table> </div>	?		£957.68	£1238.5
?					
£957.68	£1238.5				

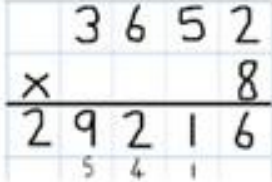
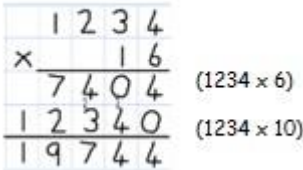
Subtraction

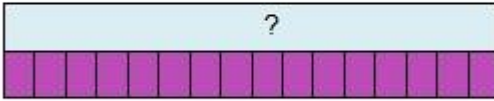

<p>Subtract with at least four digit numbers including two decimal places.</p> <p>Include money, measures and decimals ensuring that children do this practically before the abstract.</p>	<p>Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point.</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr><td>2</td><td>1</td><td>0</td><td>5</td><td>6</td></tr> <tr><td>-</td><td>2</td><td>1</td><td>2</td><td>8</td></tr> <tr><td colspan="5"><hr/></td></tr> <tr><td>2</td><td>8</td><td>9</td><td>2</td><td>8</td></tr> </table> <table border="1" style="margin: auto;"> <tr><td>7</td><td>6</td><td>9</td><td>.</td><td>0</td></tr> <tr><td>-</td><td>3</td><td>7</td><td>2</td><td>.</td><td>5</td></tr> <tr><td colspan="6"><hr/></td></tr> <tr><td>6</td><td>7</td><td>9</td><td>6</td><td>.</td><td>5</td></tr> </table> </div> <div style="text-align: right; margin-top: 20px;">  </div>	2	1	0	5	6	-	2	1	2	8	<hr/>					2	8	9	2	8	7	6	9	.	0	-	3	7	2	.	5	<hr/>						6	7	9	6	.	5
2	1	0	5	6																																								
-	2	1	2	8																																								
<hr/>																																												
2	8	9	2	8																																								
7	6	9	.	0																																								
-	3	7	2	.	5																																							
<hr/>																																												
6	7	9	6	.	5																																							

<p>Using the bar to find missing digits.</p> <p><i>It is important for children to use the bar in this way to encourage the use of it to aid with problem solving.</i></p>	<p>A whole to Lapland costs £5005 for a family of four, the Smith's have only saved £3787.75, how much money do they still need to find?</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td colspan="2" style="text-align: center;">£5005</td> </tr> <tr> <td style="text-align: center;">?</td> <td style="text-align: center;">£3787.75</td> </tr> </table> </div>	£5005		?	£3787.75
£5005					
?	£3787.75				

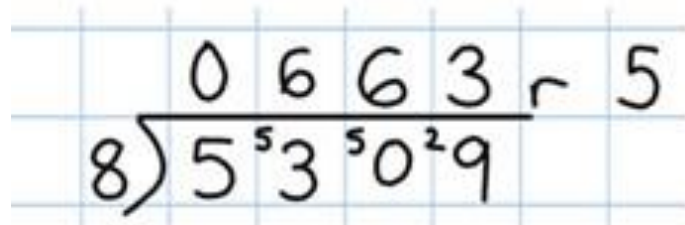
Multiplication

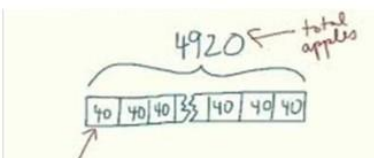
<p>Multiplying up to four digit numbers by two digits using long multiplication.</p> <p><i>Children need to be taught to approximate first, e.g. for 72 x 38, they will use rounding: 72 x 38 is approximately 70 x 40 = 2800, and use the approximation to check the</i></p>	<div style="text-align: center;"> <table style="margin: auto;"> <tr><td></td><td>56</td><td></td></tr> <tr><td>X</td><td>27</td><td></td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td></td><td>392</td><td>(56x7)</td></tr> <tr><td></td><td>1120</td><td>(56x20)</td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td></td><td>1512</td><td></td></tr> </table> </div> <div style="text-align: right; margin-top: 20px;">  </div> <p>· Explain that first we are multiplying the top number by 7 starting with the units. (any carrying needs to be done underneath the numbers).</p>		56		X	27		<hr/>				392	(56x7)		1120	(56x20)	<hr/>				1512	
	56																					
X	27																					
<hr/>																						
	392	(56x7)																				
	1120	(56x20)																				
<hr/>																						
	1512																					

<p>reasonableness of their answer.</p>	<ul style="list-style-type: none"> · Now explain that we need to put a 0 underneath—explain that this is because we are multiplying the number by 20.. (2 tens) which is the same as multiplying 10 and 2. · Now add the 2 numbers together to give you the answer. · This will need lots of modeling to show the children. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>
--	---

<p>Using the bar to support multiplication.</p>	<p>The cost to run a sports centre is £4375 a week, how much would it cost to run for 16 weeks?</p> <div style="text-align: center;">  </div> <div style="text-align: center; margin-top: 10px;">  <p>£4375 a week</p> </div>
---	--

Division

<p>Diving with up to four digit numbers by one digit including numbers where remainders are left.</p>	<div style="text-align: center; margin-bottom: 20px;">  </div> <p>Short division with remainders: Now that pupils are introduced to examples that give rise to remainder answers, division needs to have a real life problem solving context, where pupils consider the meaning of the remainder and how to express it, ie. as a fraction, a decimal, or as a rounded number or value , depending upon the context of the problem.</p>
---	--

<p>Using the bar to support division problems.</p>	<p>Bar Model to support understanding of problem solving:</p> <p>Frank has 4920 apples. He needs to put them into baskets of 40. How many baskets does he need?</p> <div style="text-align: right; margin-top: 10px;">  </div>
--	--

Year 6

Addition

Adding several numbers with up to three decimal places.

$$\begin{array}{r}
 23.361 \\
 9.080 \\
 59.770 \\
 + 1.300 \\
 \hline
 93.511 \\
 \begin{array}{l}
 2 \quad 1 \quad 2
 \end{array}
 \end{array}$$

Adding several numbers with different numbers of decimal places (including money and measures):

- Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.

Empty decimal places should be filled with zero to show

Adding using the bar.

Jack went on holiday. His flight cost £70.50, the hotel £1295 and spending money £427.89. How much did Jack spend on his holiday?

?		
£70.50	£427.89	£1295

Subtraction

Subtracting with increasingly large and more complex numbers and decimal values.

$$\begin{array}{r}
 810699 \\
 - 89949 \\
 \hline
 60750
 \end{array}$$

$$\begin{array}{r}
 1015.419 \text{ kg} \\
 - 36.080 \text{ kg} \\
 \hline
 69.339 \text{ kg}
 \end{array}$$

Very important to use in a range of contexts- measures and money.

Using the bar for subtraction.

Chloe wants to buy a new car for £6450. She has £4885.87 in her savings account. Her Dad gives her £150 for her birthday. How much more money does she need to save?

£6450		
£4885.87	£150	?

Multiplication

Short and long multiplication with up to two decimal places.

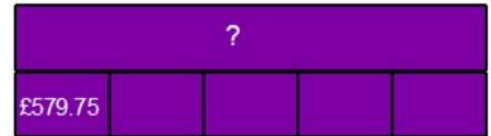
$$\begin{array}{r} 3.19 \\ \times \quad 8 \\ \hline 25.52 \end{array}$$

Approximate,
Calculate,
Check.

Using the bar to help with multiplication.

If 5 friends went on holiday and each paid £579.75 what was the total cost of the holiday?

Cost of the holiday



Division

Divide at least 4 digits by both single-digit and 2-digit numbers (including decimal numbers and quantities)

$$\begin{array}{r} 0812.125 \\ 8 \overline{)6497.000} \end{array}$$

Short division with remainders: Pupils should continue to use this method, but with numbers to at least 4 digits, and understand how to express remainders as fractions, decimals, whole number remainders, or rounded numbers. Real life problem solving contexts need to be the starting point, where pupils have to consider the most appropriate way to express the remainder.

Long division this is for when dividing by two digit numbers.

Try this equation: $848 \div 16 =$

Approximation $800 \div 16 =$ 50

$$\begin{array}{r} 053 \\ 16 \overline{)848} \\ \underline{-80} \\ 48 \\ \underline{-48} \\ 0 \end{array}$$

48 - 16 = 3
No remainders

- Start with the largest place holder in this case it will be the hundreds column.
- 8 - 16 not possible. So put a 0 above the hundreds column.
- Carry the 8 digit over to the Tens column!
- 84 - 16 =
- 16 x 5 = 80
- 84 - 80 = 4



Division

$$\begin{array}{r} 43.38 \\ 13 \overline{)564.00} \end{array}$$

$$564 \div 13 = 43 \text{ r } 5 = 43 \frac{5}{13} = 43.4 \text{ (to 1dp)}$$

1	13
2	26
4	52
5	65
8	104
10	130
20	260

Using known multiplication facts

Using the bar to help divide.

Paul and David hire a car together at a cost of £297.50. Paul pays 6 times more than David. How much does David pay?

