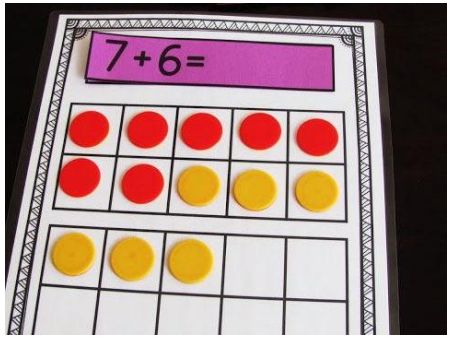
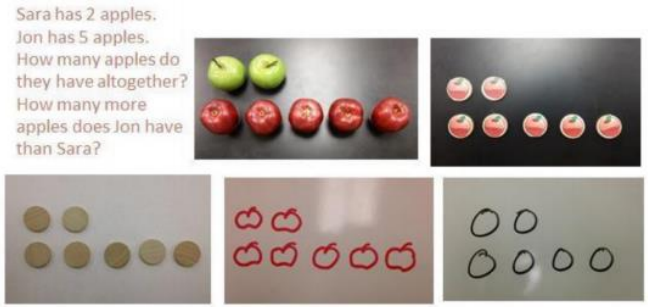
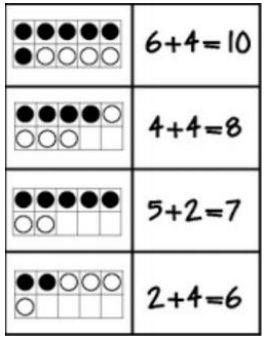
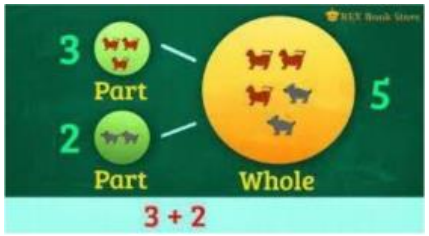
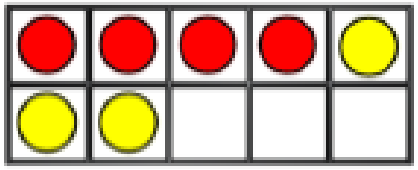
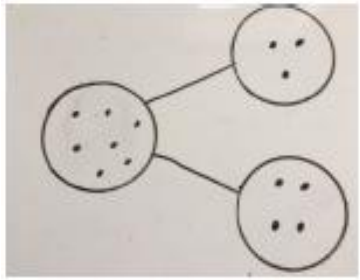
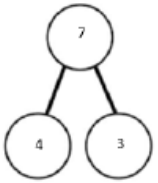
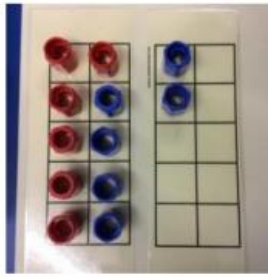
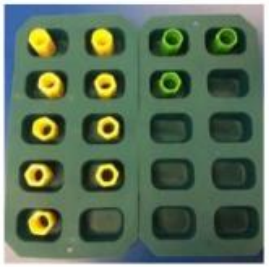
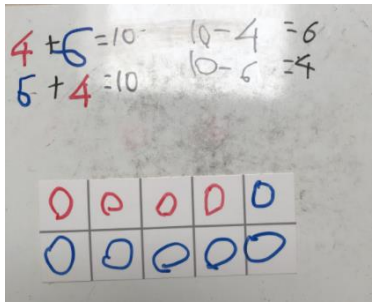
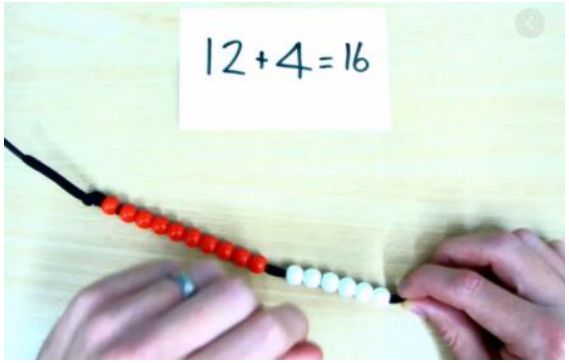
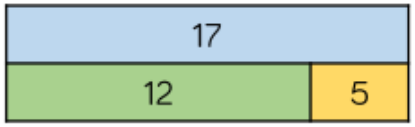
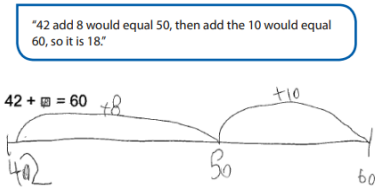
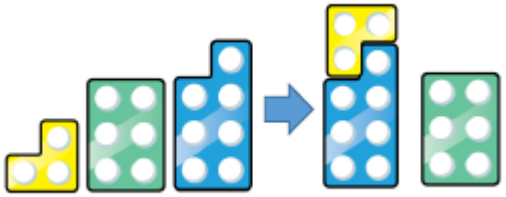
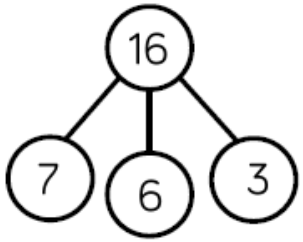
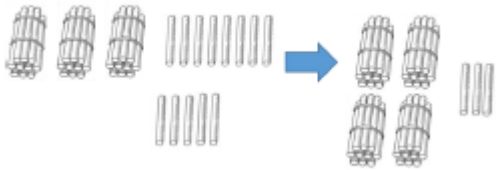
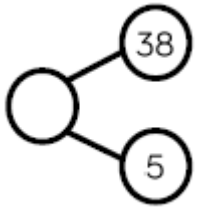
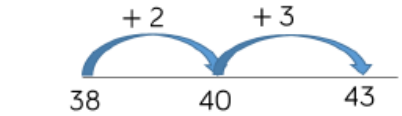
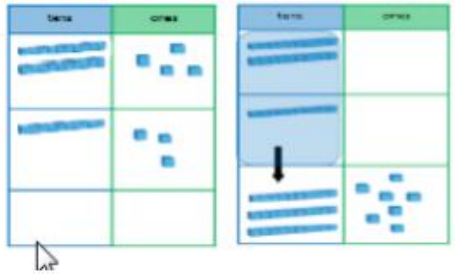
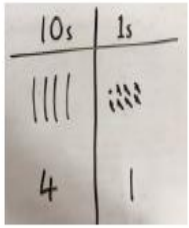
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

Year group	Concrete	Pictorial	Abstract
Addition – key vocabulary: sum, total, parts and whole, plus, add, altogether, more, 'is equal to', 'is the same as', exchange.			
Early Years			6+4=10
	Solving problems using concrete models 	Use of tens frames 	Exploring part / part / whole – combining two parts to make a whole. 

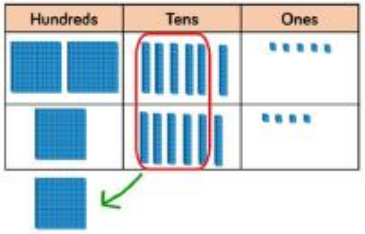
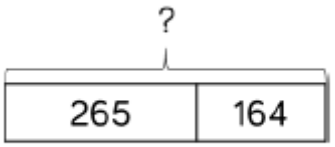
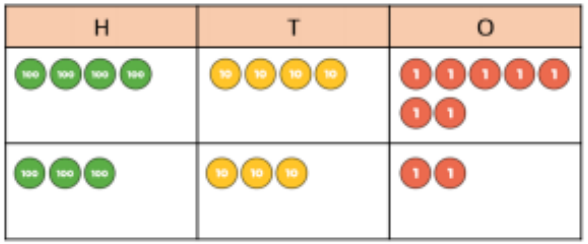
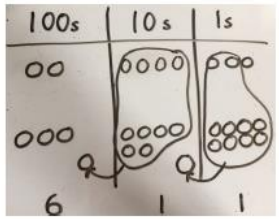
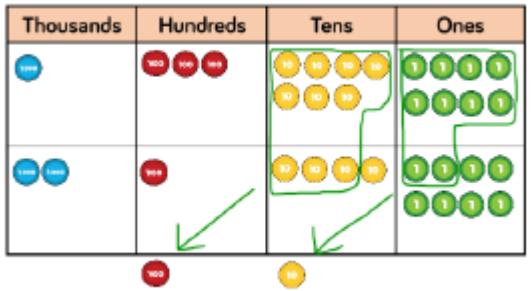
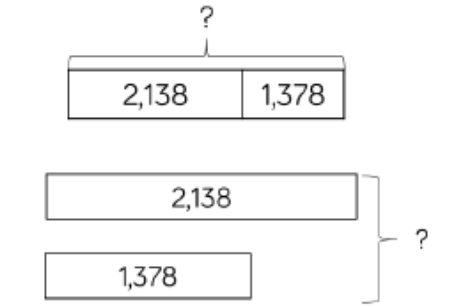
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

Year 1			4 + 3 = 7 Four is a part, 3 is a part and the whole is seven. 
Year 1 – Addition crossing boundaries of 10.	 6 + 6 = 12 		9 + 3 = 12
Year 2			

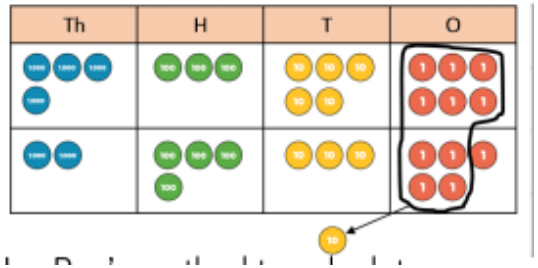
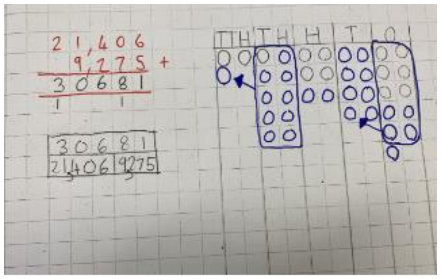
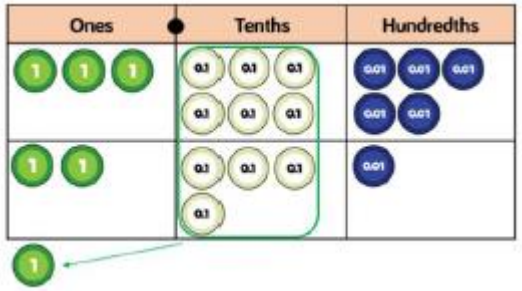
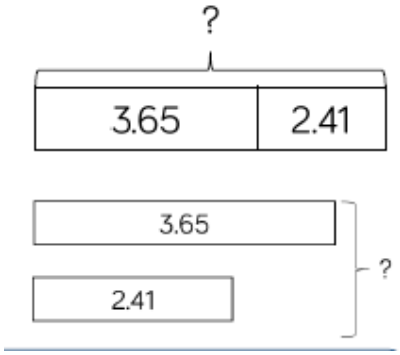
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

Year 2 – Adding 3 1 digit numbers			7+3+2=12
Year 2/3 – Adding 1 digit and 2 digit numbers to 100			 38 + 5 = 43
Year 3	24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters. 	Children to represent the base 10 pictorially. 	21 +34 21 + 34 = □ = 21 + 34 Calculate the sum of twenty-one and thirty-four.

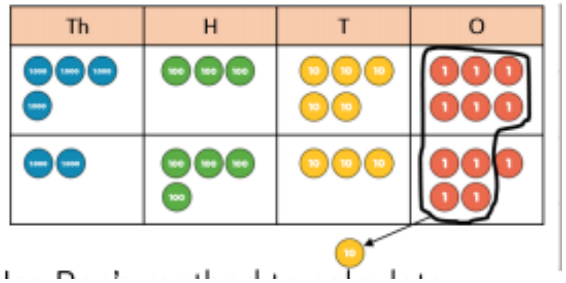
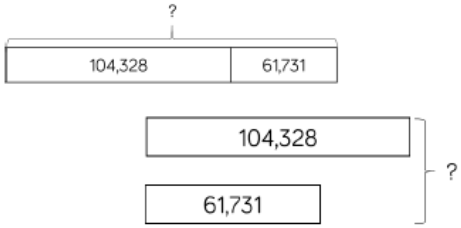
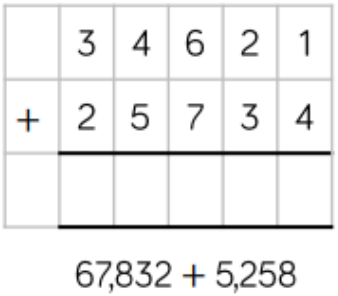
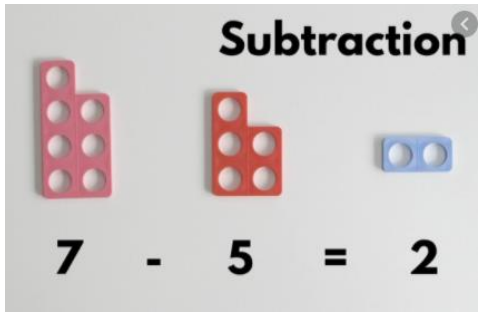
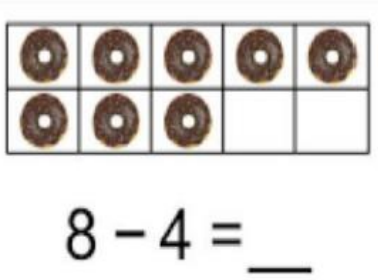
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

Year 3 – Add numbers up to 3 digits			265 + 164 429 1
Year 4		Chidren to represent the counters in a place value chart, circling when they make an exchange. 	243 +368 611 1 1
Year 4 – Add numbers up to 4 digits			1 3 7 8 + 2 1 4 8 3 5 2 6 1 1

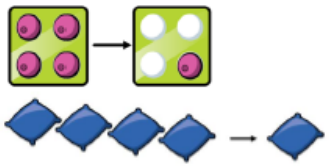
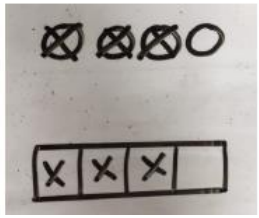
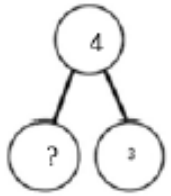
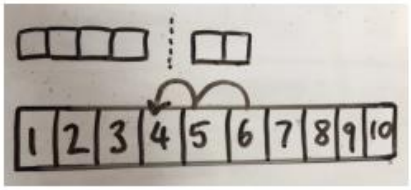
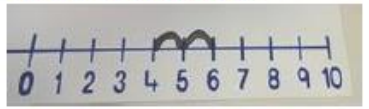
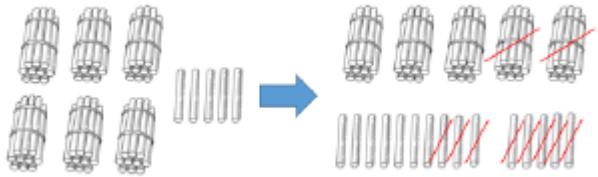
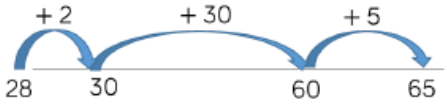
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

<table>
<tr>
<td>Year 5</td>
<td> 
</td>
<td>  </td>
<td>
<table>
<tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td>4</td><td>3</td><td>5</td><td>6</td></tr>
<tr><td>+</td><td>2</td><td>4</td><td>3</td><td>5</td></tr>
<tr><td></td><td>6</td><td>7</td><td>9</td><td>1</td></tr>
<tr><td></td><td></td><td>1</td><td></td><td></td></tr>
</table>
</td>
</tr>
<tr>
<td>Year 5 – Adding digits up to 3 decimal places</td>
<td> 
</td>
<td> 
</td>
<td>3.65
+ 2.41
6.06
1</td>
</tr>
</table>

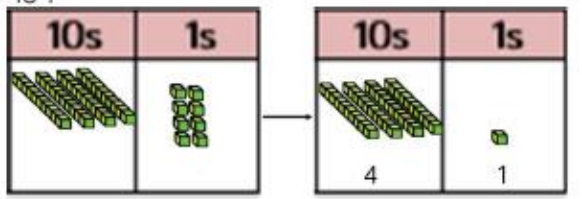
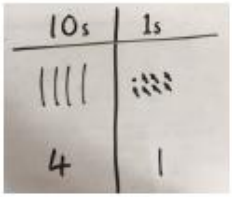
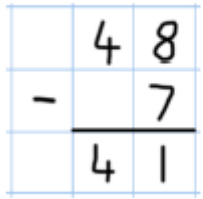
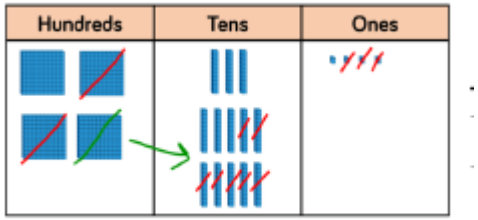
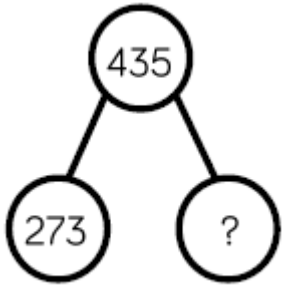
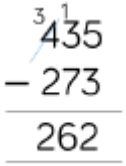
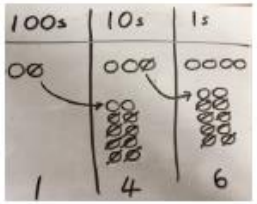
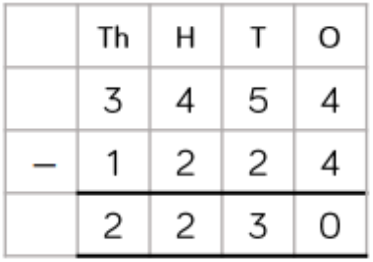
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

<table>
<tr><td>Year 6</td><td> 
</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="4">Subtraction – key vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease, exchange.</td></tr>
<tr><td>Early Years</td><td> 
</td><td> 
</td><td>10 – 4 =</td></tr>
</table>

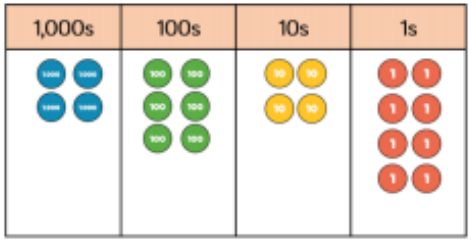
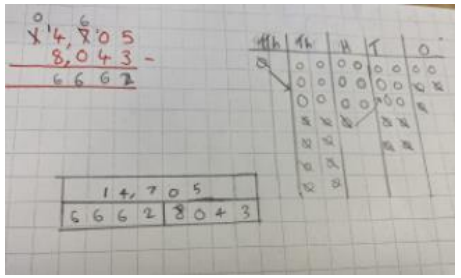
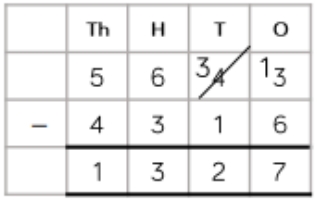
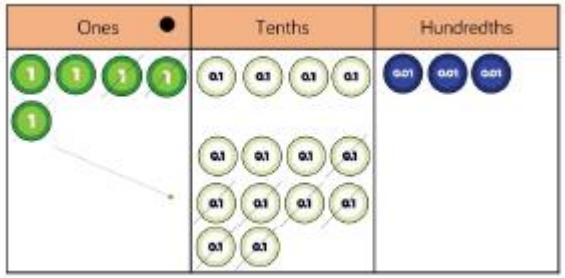
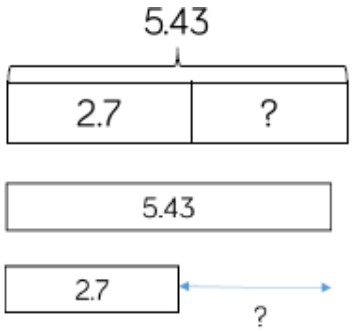
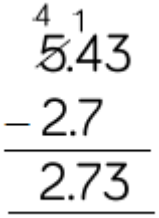
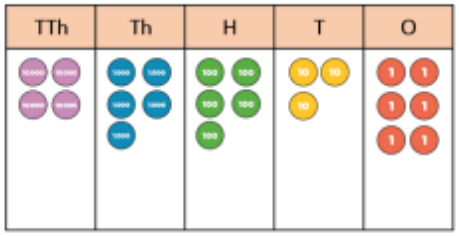
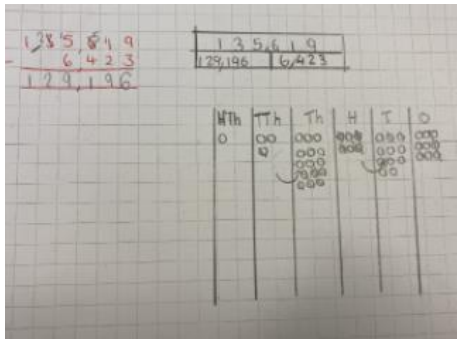
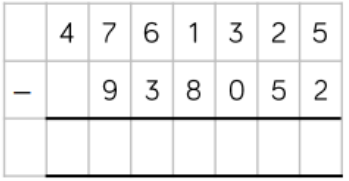
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

Year 1	**Physically taking away and removing objects from a whole** (ten frames, Numicon, cubes and other items such as beanbags could be used). 4 – 3 = 1 	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. 	4- 3 = □ = 4 – 3 
Year 2	**Counting back** (using number lines or number tracks) children start with 6 and count back 2. 6 – 2 = 4 	Children to represent what they see pictorially e.g. 	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line 
Year 2 – subtract 1 and 2 digit numbers to 100.			$\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 28 \\ \hline 37 \end{array}$

Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

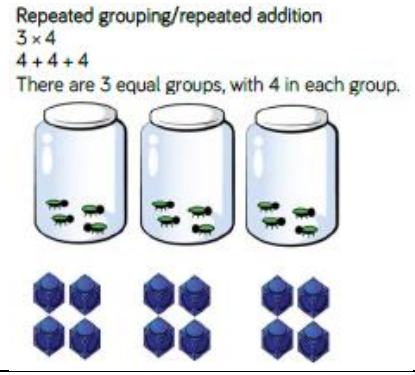
Year 3	**Column method** using base 10. 48-7 	Children to represent the base 10 pictorially. 	Column method or children could count back 7. 
Year 3 – subtract numbers up to 3 digits			
Year 4		Represent the place value counters pictorially; remembering to show what has been exchanged. 	

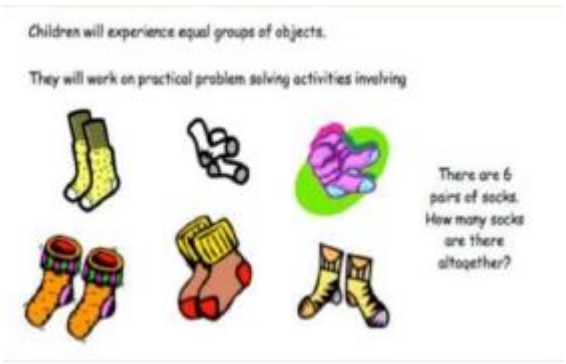
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

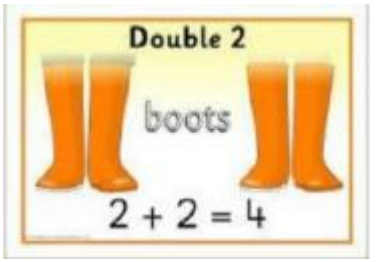
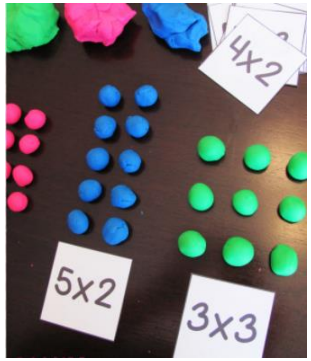
<table>
<tr>
<td>Year 5</td>
<td>4,648 – 2,347
 
</td>
<td>  </td>
<td> 
</td>
</tr>
<tr>
<td>Year 5 – subtract with up to 3 decimal places</td>
<td> 
</td>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>Year 6</td>
<td>45,536 – 8,426
 
</td>
<td>  </td>
<td> 

834,501 – 299,999</td>
</tr>
</table>

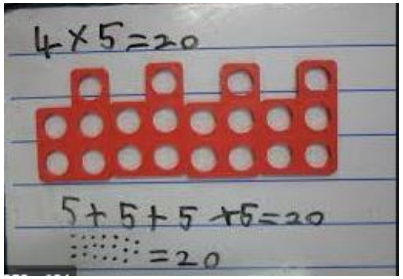
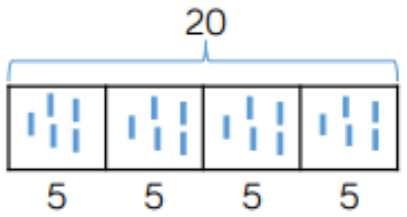
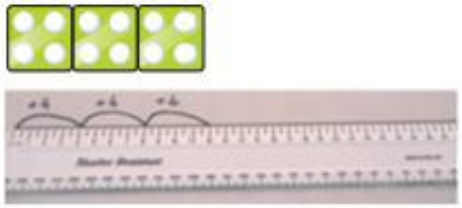
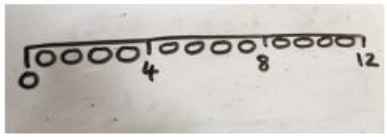
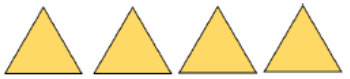
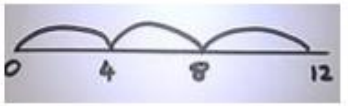
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

<table>
<tr><td colspan="4">Multiplication – key vocabulary: double, times, multiplied by, the product of, groups of, lots of, equal groups, exchange.</td></tr>
<tr><td>Early Years</td><td colspan="3"> 

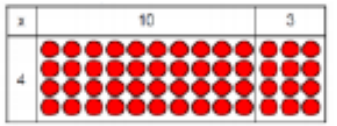
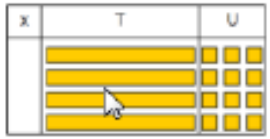


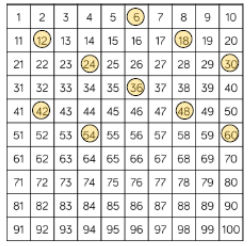
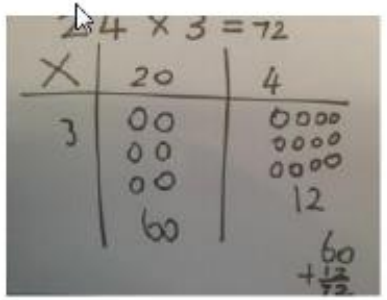
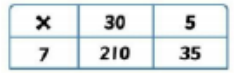
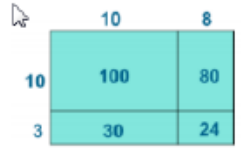
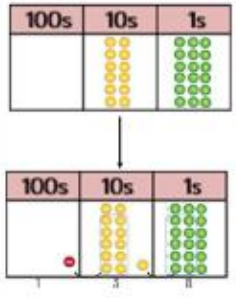
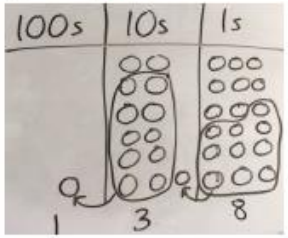

</td></tr>
<tr><td>Year 1</td><td>
</td><td> 
</td><td>1 x 2 (1+1)
5 x 10 (10+10+10+10+10)</td></tr>
</table>

Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

Year 2			2,5,10 times tables
Year 3	Number lines to show repeated groups- 3 × 4  Cuisenaire rods can be used too.	Represent this pictorially alongside a number line e.g.:   3 6 9 12	2,3,5,4,8,10 times tables Abstract number line showing three jumps of four. 3 × 4 = 12 

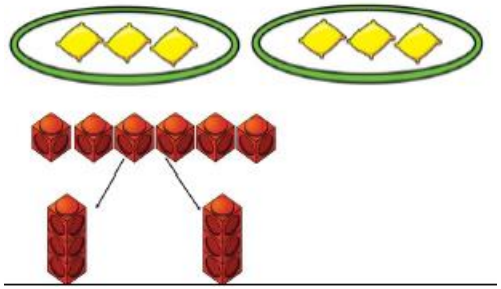
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

<table>
<tr>
<td>Year 4</td>
<td>Show the link with arrays to first introduce the grid method.
 
4 rows of 10
4 rows of 3
Move on to using Base 10 to move towards a more compact method.
 
4 rows of 13

  </td>
<td>  </td>
<td>All times tables up to 12.
Start with multiplying by one digit numbers and showing the clear addition alongside the grid.
 
210 + 35 = 245
Moving forward, multiply by a 2 digit number showing the different rows within the grid method.
  </td>
</tr>
<tr>
<td>Year 5</td>
<td>Formal column method with place value counters.
6 x 23
  </td>
<td>Children to represent the counters/base 10, pictorially e.g. the image below.
  </td>
<td>Formal written method
6 x 23 =
23
× 6
138
1 1</td>
</tr>
</table>

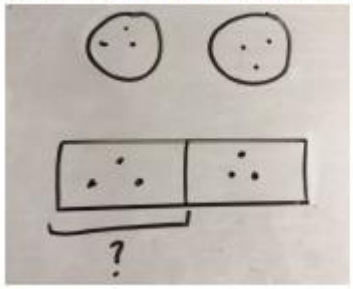
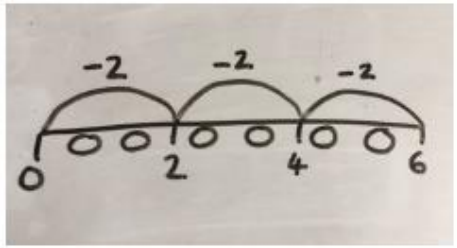
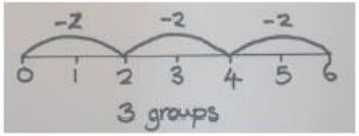
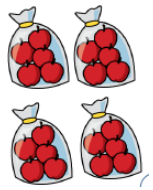
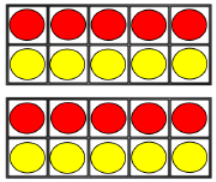
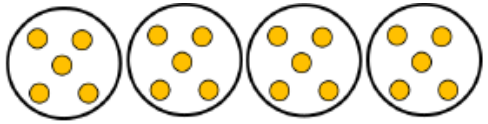
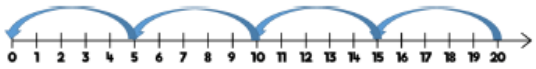
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

<table>
<tr>
<td>Year 6</td>
<td>When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract:

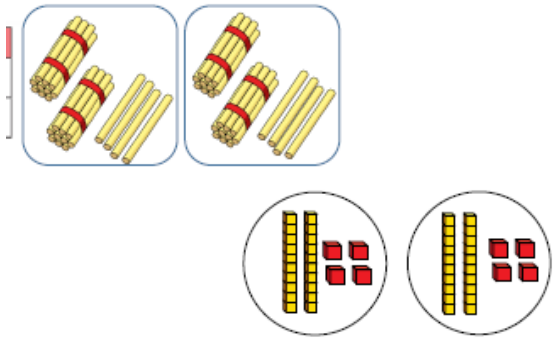
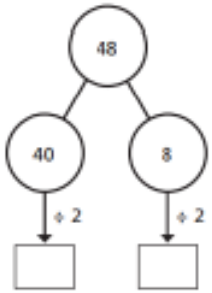
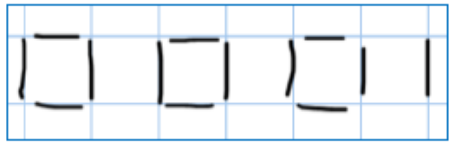
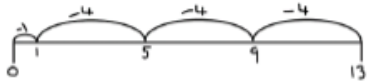
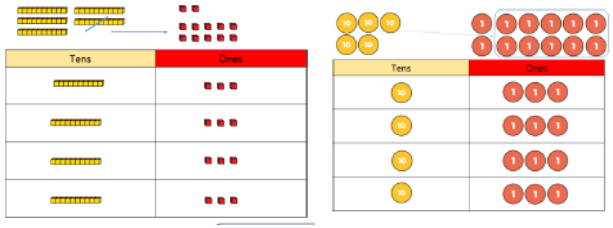
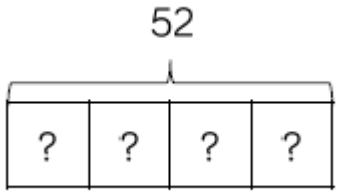
To get 744 children have solved 6 × 124.
To get 2480 they have solved 20 × 124.</td>
<td>
<table>
<tr><td></td><td>1</td><td>2</td><td>4</td></tr>
<tr><td>×</td><td></td><td>2</td><td>6</td></tr>
<tr><td></td><td>7
1</td><td>4
2</td><td>4</td></tr>
<tr><td>2</td><td>4</td><td>8</td><td>0</td></tr>
<tr><td>3</td><td>2</td><td>2</td><td>4</td></tr>
<tr><td>1</td><td>1</td><td></td><td></td></tr>
</table>
Answer: 3224
</td>
</tr>
<tr>
<td colspan="3">Division – key vocabulary: share, group, divide, divided by, half, exchange.</td>
</tr>
<tr>
<td>Early Years</td>
<td colspan="2">Sharing using a range of objects.
6 ÷ 2
 

</td>
</tr>
</table>

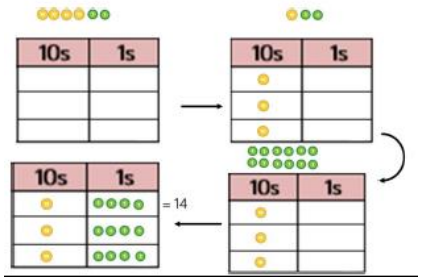
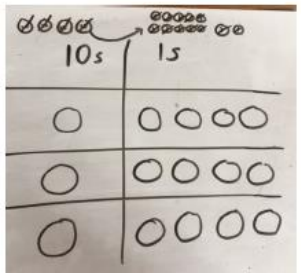
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

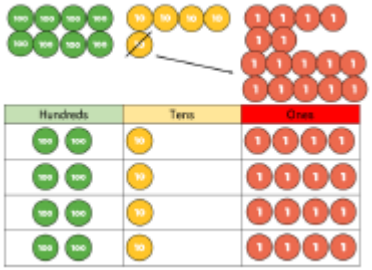
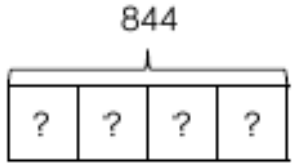
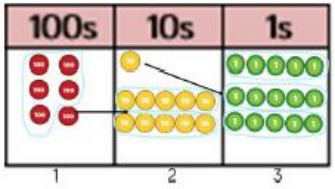
Year 1	Share the muffins equally between the two plates. Complete the sentence. ___ cakes shared equally between 2 is ___ 	Represent the sharing pictorially. 	$6 \div 2 = 3$ 3 | 3 Children should also be encouraged to use their 2 times tables facts.
Year 2	Share the 12 cubes equally into the two boxes. There are ___ cubes altogether. There are ___ boxes. There are ___ cubes in each box. Can you share the 12 cubes equally into 3 boxes?	Children to represent repeated subtraction pictorially. 	Abstract number line to represent the equal groups that have been subtracted. 
Year 1 /2 Solve problems - grouping	There are 20 apples altogether. They are put in bags of 5. How many bags are there?  	 	$20 \div 5 = 4$

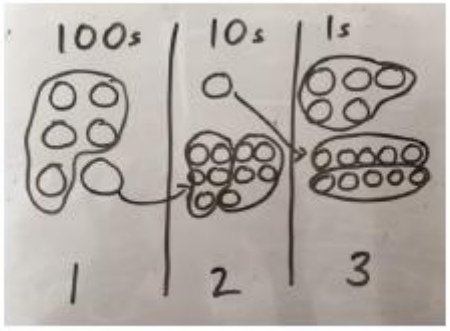
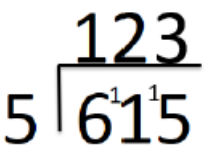
Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

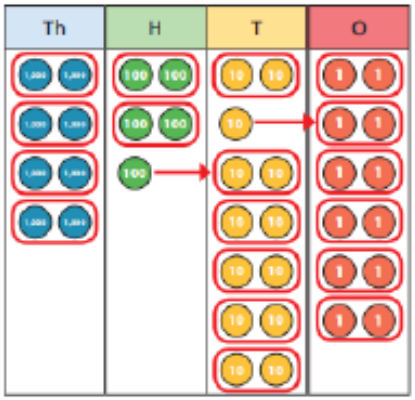
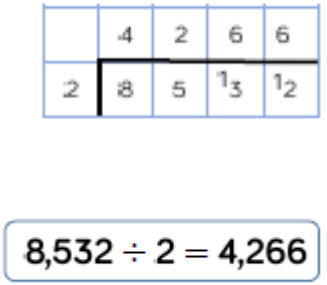
Year 1 /2 – divide 2 digits by 1 digit (sharing with no exchange)			$48 \div 2 = 24$
Year 3	**2d ÷ 1d with remainders** using lollipop sticks. Cuisenaire rods, above a ruler can also be used. 13 ÷ 4 Use of lollipop sticks to form wholes- squares are made because we are dividing by 4. There are 3 whole squares, with 1 left over.	Children to represent the lollipop sticks pictorially.  There are 3 whole squares, with 1 left over.	13 ÷ 4 = 3 remainder 1 Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line. '3 groups of 4, with 1 left over' 
Year 3 /4 – divide 2 digits by 1 digit (sharing with exchange) Year 3 – base 10 Year 4 –place value counters			$52 \div 4 = 13$

Brooklands Calculation Policy – Addition, Subtraction, Multiplication, Division.

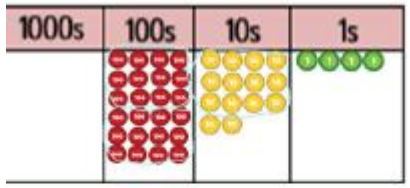
<table>
<tr>
<td>Year 4</td>
<td>Sharing using place value counters.
42 ÷ 3 = 14
 
</td>
<td>Children to represent the place value counters pictorially.
 
</td>
<td>Children to be able to make sense of the place value counters and write calculations to show the process.

42 ÷ 3
42 = 30 + 12
30 ÷ 3 = 10
12 ÷ 3 = 4
10 + 4 = 14</td>
</tr>
<tr>
<td>Year 4 – divide 3 digits by 1 digit (sharing)</td>
<td> 
</td>
<td> 
</td>
<td>844 ÷ 4 = 122</td>
</tr>
<tr>
<td>Year 5</td>
<td>Short division using place value counters to group.
615 ÷ 5
 

1. Make 615 with place value counters.
2. How many groups of 5 hundreds can you make with 6 hundred counters?
3. Exchange 1 hundred for 10 tens.
4. How many groups of 5 tens can you make with 11 ten counters?
5. Exchange 1 ten for 10 ones.
6. How many groups of 5 ones can you make with 15 ones?</td>
<td>Represent the place value counters pictorially.
 
</td>
<td>Children to the calculation using the short division scaffold.
 
</td>
</tr>
</table>

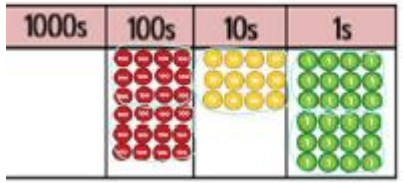
Year 5 – divide 4 digits by 1 digit (grouping)		

Year 6



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

```
   021
12|2544
  24
  14
  12
   2
```



After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

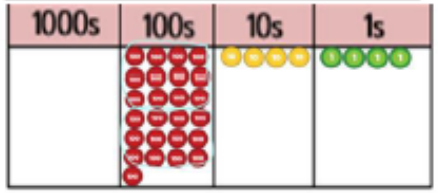
```
   0212
12|2544
  24
  14
  12
  24
  24
   0
```

	0	4	8	9	
15	7	3	3	5	
–	6	0	0	0	(×400)
	1	3	3	5	
–	1	2	0	0	(×80)
		1	3	5	
–		1	3	5	(×9)
				0	

1 × 15 = 15
2 × 15 = 30
3 × 15 = 45
4 × 15 = 60
5 × 15 = 75
10 × 15 = 150

Long division using place value counters
2544 ÷ 12

We can't group 2 thousands into groups of 12 so will exchange them.



We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

```
   02
12|2544
  24
   1
```

		0	3	6	
1	2	4	3	2	(×30)
	–	3	6	0	
			7	2	(×6)
	–		7	2	
				0	

12 × 1 = 12
12 × 2 = 24
12 × 3 = 36
12 × 4 = 48
12 × 5 = 60
12 × 6 = 72
12 × 7 = 84
12 × 8 = 96
12 × 7 = 108
12 × 10 = 120