

# HINDLEY J AND I SCHOOL

## Written Calculation Policy



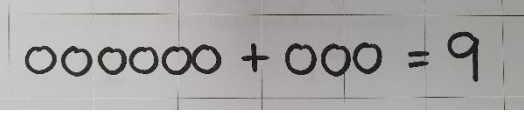
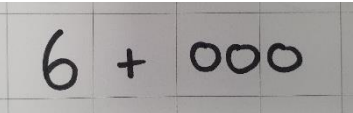
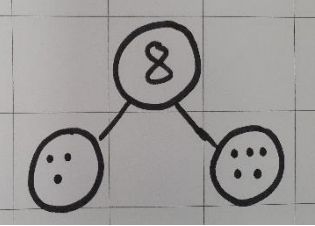
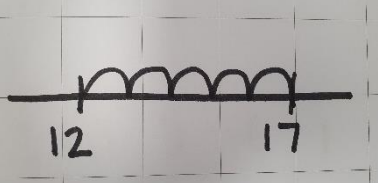
September 2020



\_\_\_\_\_ Signed on behalf of the school \_\_\_\_\_ Date

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	<b>Early Years</b>
Calculation	Written Strategy

	<b>Year 1</b>
Calculation	Written Strategy
$6 + 9 = 9$	<p>Children begin by drawing the amounts they are adding:</p>  <p>Moving to starting with largest number, counting on with the smaller number:</p> 
$3 + 5 = 8$	<p>Combining to parts to make a whole in a part-whole model:</p> 
$12 + 5 = 17$	<p>Children create their own blank number lines to calculate their answer.</p> 



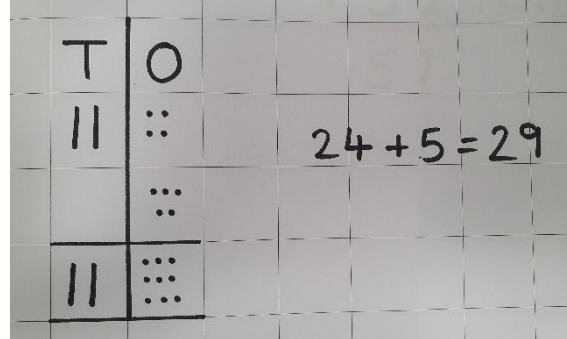
## Year 2

### Calculation

### Written Strategy

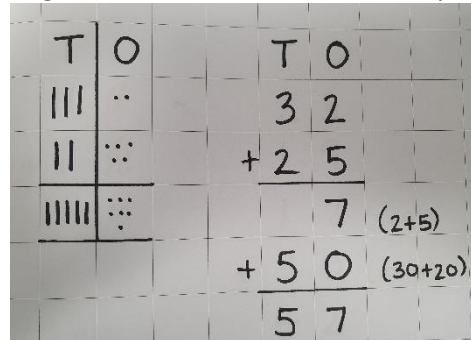
$28 + 14 = 42$

Children begin to use practical equipment in columns to calculate the answer, moving to recording this written:



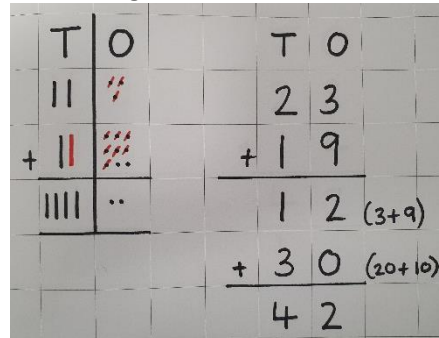
$32 + 25 = 57$

After becoming secure recording their answer pictorially (left), they begin to record their additions in expanded column addition (right):



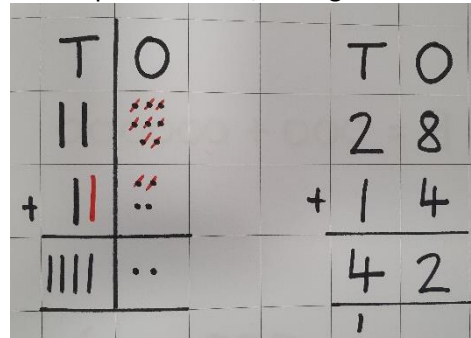
$23 + 19 = 42$

Children use the expanded column addition method to understand how to exchange ones and tens.



$28 + 14 = 42$

When the children become confident, they begin to record their answer as compact addition, noting carried-over digits below:





### Year 3

#### Calculation

#### Written Strategy

$32 + 24 = 56$

Children only record pictorially (left) at the very beginning of Year 3 to recap prior learning. Children to then only record abstract (right):

T	O		T	O
III	..		3	2
+ II	::		+ 2	4
IIII	:::		5	6

$147 + 36 = 183$


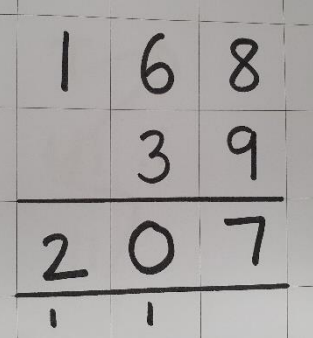
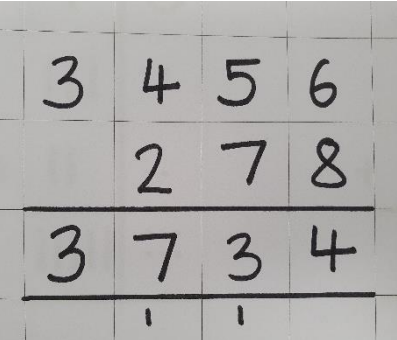
Children to use pictorial representation to become confident with compact column addition using 3-digit numbers including carrying:


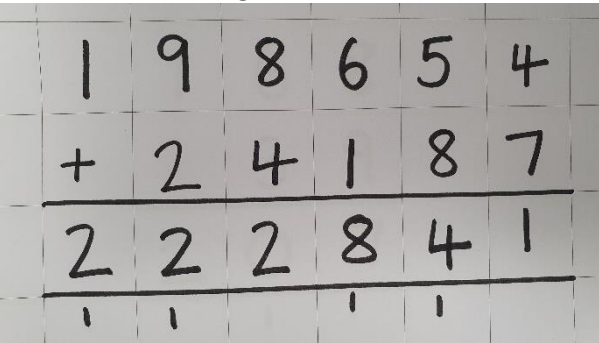
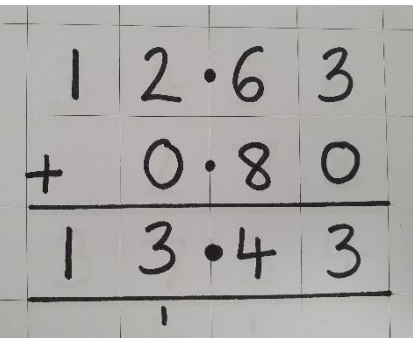
H	T	O	H	T	O
□	IIII	///	1	4	7
+ □	IIII	///	+ 3	6	
□	IIII	...	1	8	3


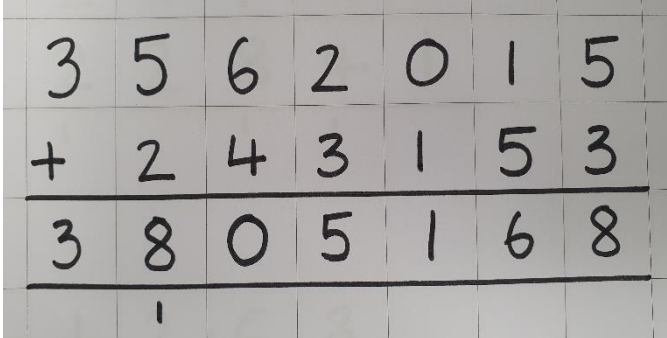
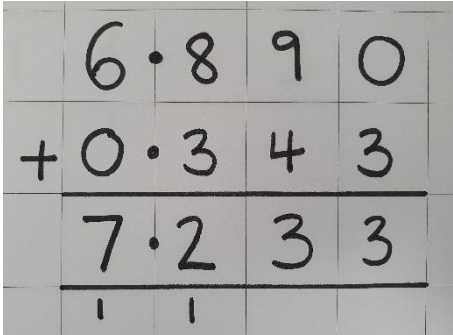
$226 + 115 = 341$


Children to move to compact column addition without using pictorial representations:


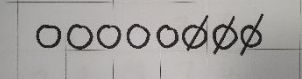
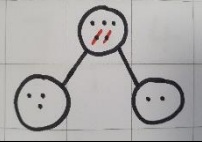
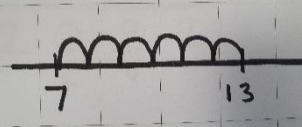
H	T	O
2	2	6
+ 1	1	5
3	4	1

	Year 4
Calculation	Written Strategy
$168 + 39 = 207$	Children to record addition in columns, recording carrying over below: 
$3,456 + 278 = 3,734$	Children use column addition with up to 4-digit numbers: 

	Year 5
Calculation	Written Strategy
$198,654 + 24,187 = 222,841$	Children use column addition as shown in Year 4, but also for numbers with more than 4-digits: 
$12.63 + 0.8 = 13.43$	Children use column addition with decimals, using 0 place value holders: 

	Year 6
Calculation	Written Strategy
$3,562,015 + 243,153$ $= 3,805,168$	Children use column addition as shown in Year 5: 
$6.89 + 0.343 = 7.233$	Children use column addition with decimals, using 0 place value holders: 

	<b>Early Years</b>
Calculation	Written Strategy

	<b>Year 1</b>
Calculation	Written Strategy
$8 - 3 = 5$	<p>Children begin by drawing the amount to begin with, and cross out the amount they are subtracting:</p> 
$5 - 2 = 3$	<p>Children to use part-whole model to show how subtracting creates two parts, helping to make link with addition.</p> 
$12 + 5 = 17$	<p>Children are taught how to use a blank number line for subtraction (counting backwards) and then encouraged to draw their own number line:</p> 



## Year 2

### Calculation

### Written Strategy

$18 - 6 = 12$

Children begin to use practical equipment in columns to calculate the answer, moving to recording this written:

T	O
1	<del>8</del>
1	2

 $18 - 6 = 12$

$64 - 21 = 43$

After becoming secure recording their answer pictorially (left), they begin to record their subtractions in column subtraction (right):

T	O
<del>   </del>	· · ·
4	3

T	O
6	4
- 2	1
4	3

$31 - 15 = 16$

When the children become confident, they begin to use subtraction with exchanging:

T	O
<del>3</del>	1
1	6

T	O
2	1
- 1	5
1	6





### Year 3

#### Calculation

#### Written Strategy

$68 - 35 = 33$

Children only record pictorially (left) at the very beginning of Year 3 to recap prior learning. Children to then only record abstract (right):

T	O		T	O
III			6	8
XXX			-	35
3	3			33

$243 - 27 = 216$


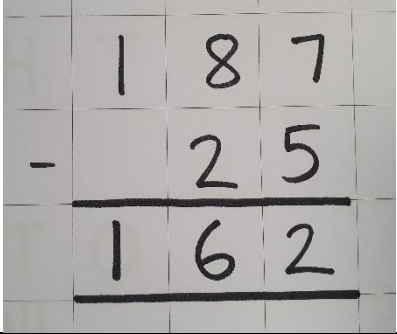
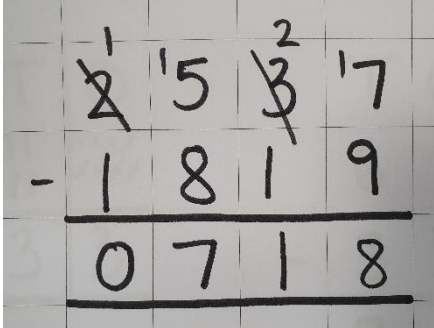
Children to use pictorial representation to become confident with column subtraction using 3-digit numbers including exchanging:


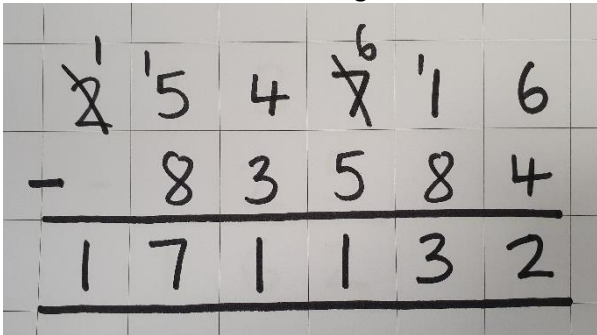
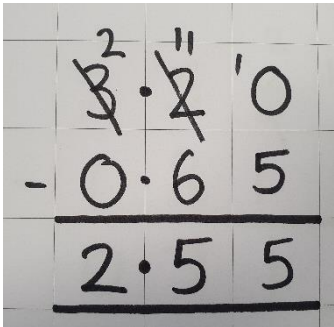
H	T	O		H	T	O
□				2	4 <sup>3</sup>	13
	XXX			-	27	
2	1	6			216	

$421 - 289 =$

Children to move to column subtraction without using pictorial representations:

	H	T	O
	4 <sup>3</sup>	2 <sup>1</sup>	1
-	2	8	9
	1	3	2

	Year 4
Calculation	Written Strategy
$187 - 25 = 162$	Children to record subtraction in columns: 
$2,537 - 1,819 = 718$	Children use column subtraction with up to 4-digit numbers: 

	Year 5
Calculation	Written Strategy
$254,716 - 83,584 = 171,132$	Children use column subtraction as shown in Year 4, but also for numbers with more than 4-digits: 
$3.2 - 0.65 = 2.55$	Children use column subtraction with decimals, using 0 place value holders: 



## Year 6

### Calculation

$$2,316,145 - 592,037 = 1,724,108$$

### Written Strategy


Children use column subtraction as shown in Year 5:


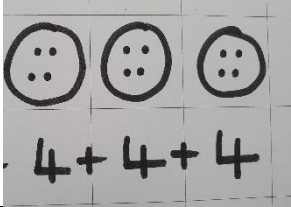
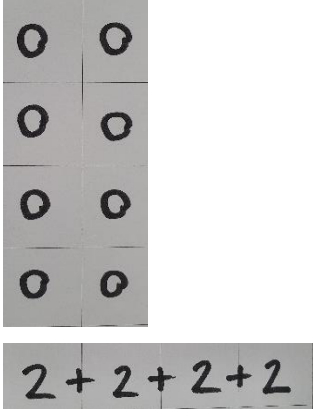
$$\begin{array}{r} \overset{1}{2} \overset{12}{3} \overset{1}{1} \overset{1}{6} \overset{1}{1} \overset{3}{4} \overset{1}{5} \\ - \quad 5 \quad 9 \quad 2 \quad 0 \quad 3 \quad 7 \\ \hline 1 \quad 7 \quad 2 \quad 4 \quad 1 \quad 0 \quad 8 \end{array}$$

$$7 - 0.52 = 6.48$$

Children use column subtraction with decimals, using 0 place value holders:

$$\begin{array}{r} \overset{6}{7} \overset{9}{0} \overset{10}{0} \\ - \quad 0 \quad 5 \quad 2 \\ \hline 6 \quad 4 \quad 8 \end{array}$$

	<b>Early Years</b>
Calculation	Written Strategy

	<b>Year 1</b>
Calculation	Written Strategy
<p><i>3 lots of 4</i></p>	<p>To help solve problems, children will use concrete objects and pictorial representations to support their ideas of multiplication:</p> 
<p><i>4 groups of 2</i></p>	<p>Children will be introduced to an array to support multiplication and to support the understanding that multiplication is repeated addition</p> 



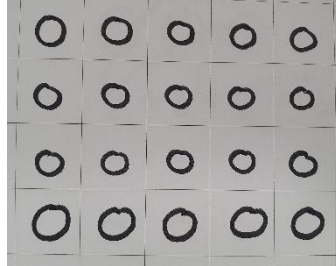
## Year 2

### Calculation

### Written Strategy

$$3 \times 5 = 15$$

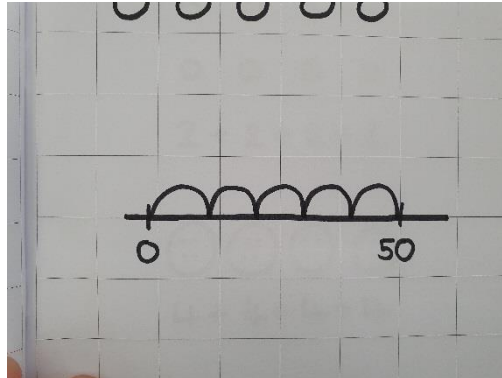
Children will be able to represent a multiplication calculation using an array and write the multiplication symbol within a number sentence.



Children will also understand that multiplication can be carried out in any order (commutative)

$$5 \times 10 = 50$$

Children will understand the operation of multiplication as repeated addition on a blank number line:





### Year 3

#### Calculation

#### Written Strategy

$$21 \times 3$$

Children will be taught to multiply numbers (TO x O) through partitioning and the formal written method of grid multiplication.

This method will also help children to gain a solid understanding of multiplying a multiple of 10.

$$\begin{array}{|c|c|c|} \hline \times & 20 & 1 \\ \hline 3 & \text{|||||} & \dots \\ \hline \end{array}$$
$$60 + 3 = 63$$

$$83 \times 4 = 332$$

Children will be taught to multiply numbers (TO x O) using the formal written method of expanded column multiplication and make the link to grid method:

$$\begin{array}{r} 83 \\ \times 4 \\ \hline 12 \\ + 320 \\ \hline 332 \end{array}$$



## Year 4

### Calculation

$$138 \times 4 = 552$$

### Written Strategy

Children to record multiplication in expanded method, like Y3 for 2 and 3-digit numbers:

	1	3	8
x			4
<hr/>			
		3	2
	1	2	0
+ 4	0	0	
<hr/>			
	5	5	2



### Year 5

#### Calculation

#### Written Strategy

$4,326 \times 7$

Children to move to formal short multiplication (compact) up to 4-digits:

Handwritten short multiplication for  $4,326 \times 7$  on a grid background. The numbers are written in black ink. The multiplier 7 is aligned under the ones place of 4,326. A horizontal line is drawn under 4,326. The product 30,282 is written below the line, with a horizontal line under it. Small numbers 2, 1, and 4 are written below the tens, hundreds, and thousands places respectively, indicating the carry-over process.

$43 \times 25 = 1,075$

Children taught long-multiplication method to up 4-digits:

Handwritten long multiplication for  $43 \times 25$  on a grid background. The numbers are written in black ink. The multiplier 25 is aligned under 43. A horizontal line is drawn under 43. The first partial product 215 is written below the line, with a horizontal line under it. The second partial product 860 is written below the first, with a horizontal line under it. The final product 1,075 is written below the second partial product, with a horizontal line under it.

$136 \times 27 = 3,672$

Handwritten long multiplication for  $136 \times 27$  on a grid background. The numbers are written in black ink. The multiplier 27 is aligned under 136. A horizontal line is drawn under 136. The first partial product 952 is written below the line, with a horizontal line under it. The second partial product 2,720 is written below the first, with a horizontal line under it. The final product 3,672 is written below the second partial product, with a horizontal line under it.

$2,756 \times 43 = 118,508$

Handwritten long multiplication for  $2,756 \times 43$  on a grid background. The numbers are written in black ink. The multiplier 43 is aligned under 2,756. A horizontal line is drawn under 2,756. The first partial product 8,268 is written below the line, with a horizontal line under it. The second partial product 110,240 is written below the first, with a horizontal line under it. The final product 118,508 is written below the second partial product, with a horizontal line under it.





## Year 6

### Calculation

$$3,829 \times 36$$
$$= 137,844$$

### Written Strategy


Children use long multiplication as shown in Year 5:


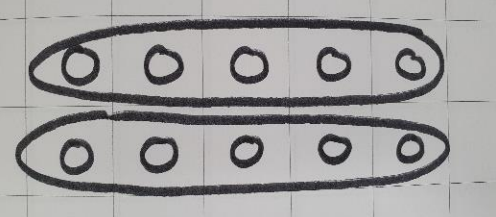
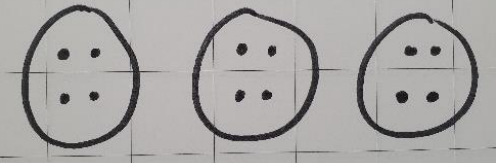
$$\begin{array}{r} 3829 \\ \times 36 \\ \hline 22974 \\ 114870 \\ \hline 137844 \end{array}$$

$$7 - 0.52 = 6.48$$

Children use short multiplication as shown in Year 5, also using the strategy for decimal numbers:

$$\begin{array}{r} 3.47 \\ \times 6 \\ \hline 20.82 \end{array}$$

	<b>Early Years</b>
Calculation	Written Strategy

	<b>Year 1</b>
Calculation	Written Strategy
<p>How many groups of 5 are in 10?</p>	<p>Children will be introduced to an array to support division:</p> 
<p>Share 12 into 3 groups</p>	<p>Children will understand equal groups to divide:</p> 



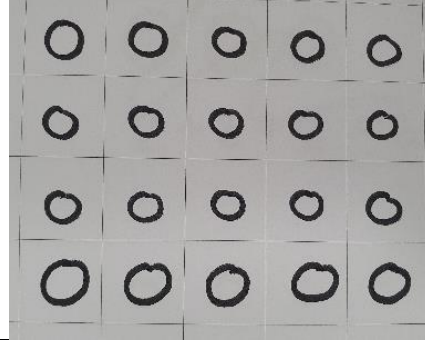
## Year 2

### Calculation

### Written Strategy

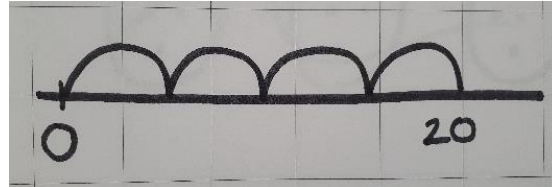
$$15 \div 5 = 3$$

Children will be able to represent a division calculation using an array and write the division within a number sentence:



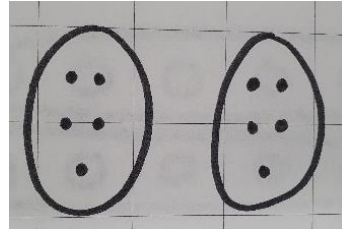
$$20 \div 5 = 4$$

Children will use number lines to divide, to support formal short division in KS2 e.g. "how many groups of 5s in 20?":



$$10 \div 2 = 5$$

Children will use a written strategy to show how 10 is shared between 2.



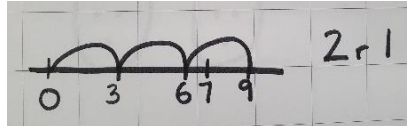
**Calculation**
**Written Strategy**

$17 \div 4 = 4r1$

Before formal short division is used, children will develop a solid understanding of remainders. E.g. "how many groups of 4 are in 17":

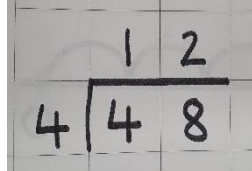


$7 \div 3 = 2r1$



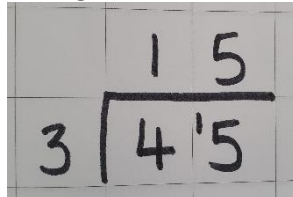
$48 \div 4 = 12$

Children are first taught short division method where there are no remainders being passed through the calculation:



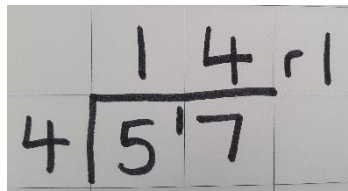
$45 \div 3 = 15$

When children are confident with the above 2 processes, they begin to use short division where there are remaining digits being passed through:



$57 \div 4 = 14r1$

Where there is a remainder at the end of the calculation, children note this as 'rX':





## Year 4

### Calculation

### Written Strategy

$$268 \div 4 = 67$$


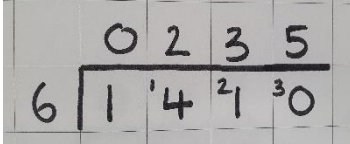
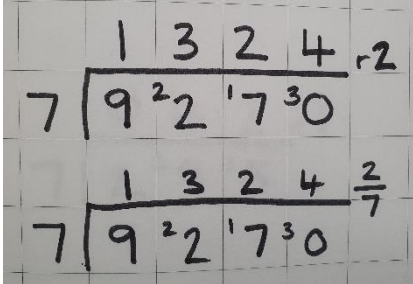
Children to use short division as in Y3, for 2 and 3-digit numbers:


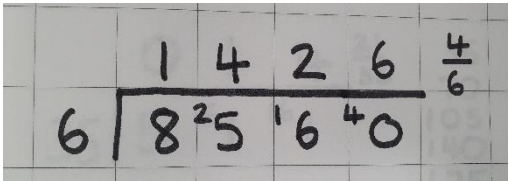
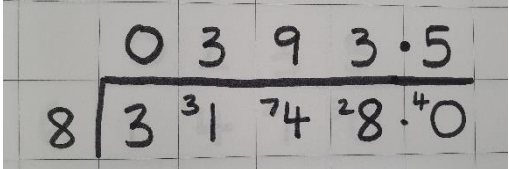
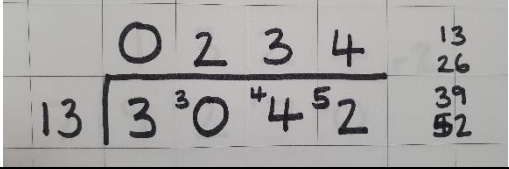
A handwritten short division calculation on a grid background. The divisor '4' is written to the left of a vertical bar. The dividend '268' is written below the bar, with a '2' above the '6' and another '2' above the '8'. The quotient '067' is written above the bar.

$$295 \div 7 = 42r1$$

Where there is a remainder at the end of the calculation, children note this as 'rX':

A handwritten short division calculation on a grid background. The divisor '7' is written to the left of a vertical bar. The dividend '295' is written below the bar, with a '2' above the '9' and a '1' above the '5'. The quotient '042' is written above the bar, followed by 'r1' to the right of the bar.

 <b>Year 5</b>	
Calculation	Written Strategy
$1,410 \div 6 = 235$	Children to use short division as in Y3, for up to 4-digit numbers: 
$9,270 \div 7 = 1,324 \frac{2}{7}$	Children write remainders as 'rX', before moving to as fractions: 

 <b>Year 6</b>	
Calculation	Written Strategy
$8,560 \div 6 = 1,426 \frac{4}{6}$	Children use short division as in Year 5: 
$3,148 \div 8 = 393.5$	Children use short division as in Year 5 but using decimals to find remainders when appropriate: 
$3,042 \div 13 = 234$	Children divide by 2-digit numbers using the above short division strategy, noting down their times tables to support: 
$511 \div 35 = 14 \frac{21}{35}$	Children become confident when remainders moving through the division are more than 1 digit: 