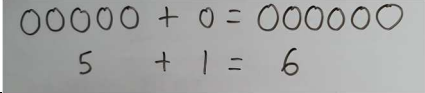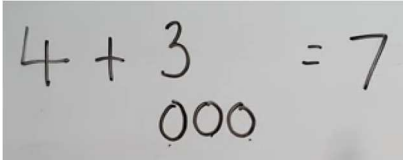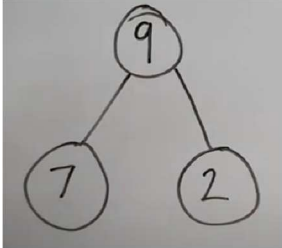# HINDLEY J AND I SCHOOL

Written Calculation Policy
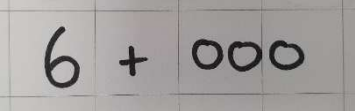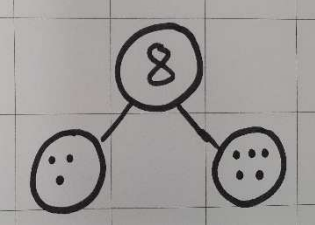
September 2023

This Policy is also supplemented by self-guide video tutorials on the school website
https://hindley.wigan.sch.uk/maths.html

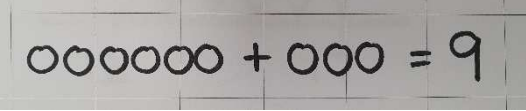| Addition	**Early Years**
Calculation	Written Strategy
5+1 =6	
4 + 3 =7	Children count on form the biggest number by drawing three objects/circles first
7 +2 = 9	Children start at the biggest number and count on in their heads (using fingers if they need to).

Addition	**Year 1**
Calculation	Written Strategy
$6 + 9 = 9$	Children begin by drawing the amounts they are adding: Moving to starting with largest number, counting on with the smaller number: Similar to Reception but will work with a bigger number range.
$3 + 5 = 8$	Combining to parts to make a whole in a part-whole model:
$12 + 5 = 17$	Children create their own blank number lines to calculate their answer.
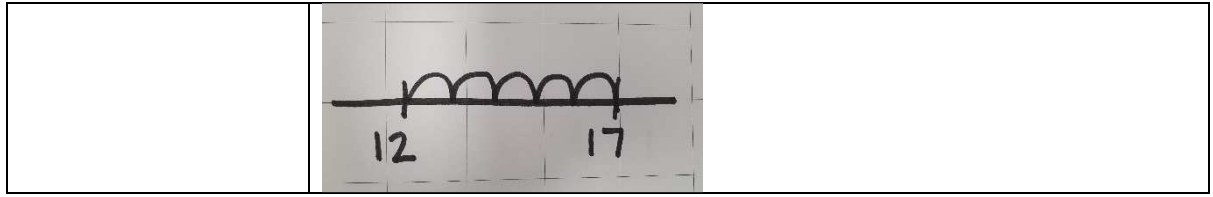
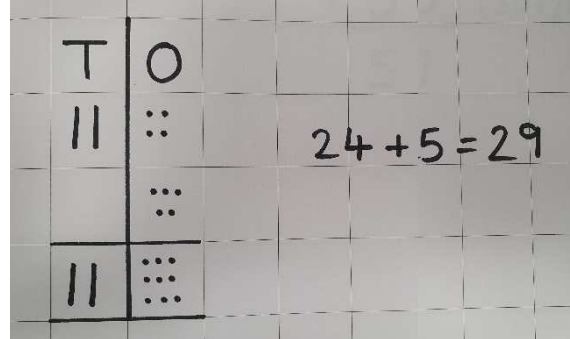| | | |

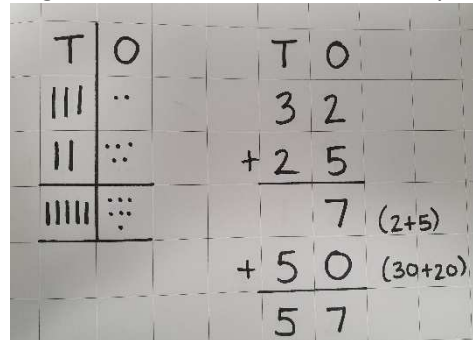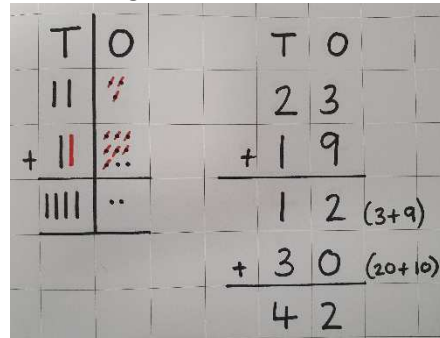|	**Year 2**
Calculation	Written Strategy
28 + 14 = 42	Children begin to use practical equipment in columns to calculate the answer, moving to recording this written:
32 + 25 = 57	After becoming secure recording their answer pictorially (left), they begin to record their additions in expanded column 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:
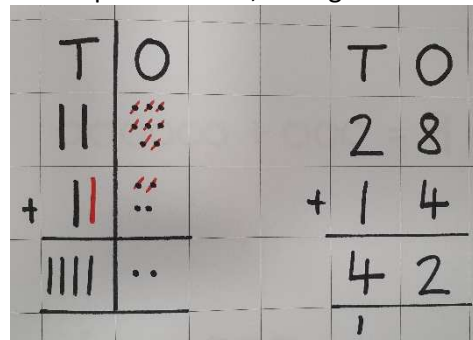
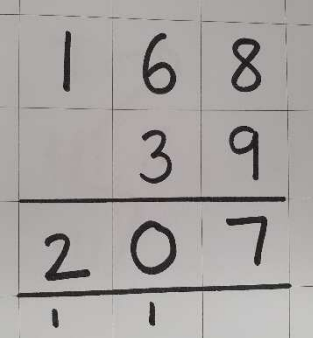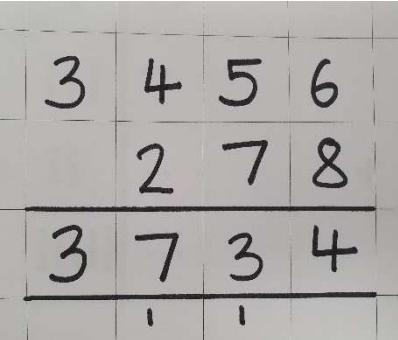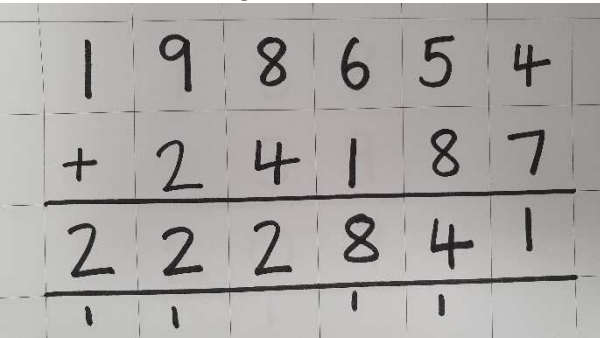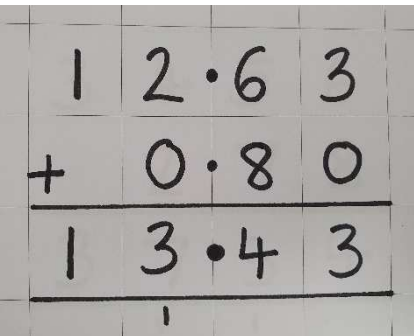| Addition	Year 3
Calculation	Written Strategy
32 + 24 = 56	Children only record pictorially (left) at the very beginning of Year 3 to recap prior learning. Children to then only record abstract (right):
147 + 36 = 183	Children to use pictorial representation to become confident with compact column addition using 3-digit numbers including carrying:
226 + 115 = 341	Children to move to compact column addition without using pictorial representations:
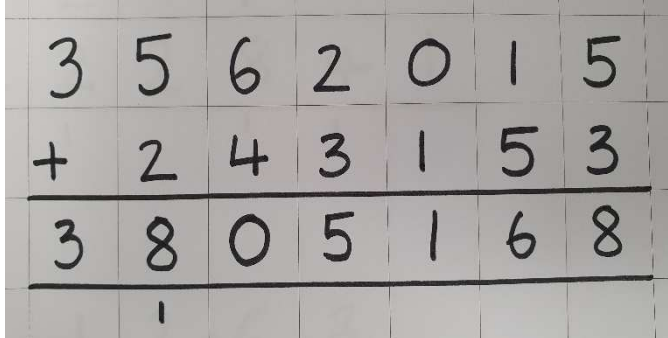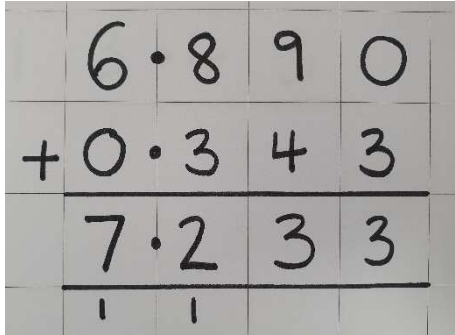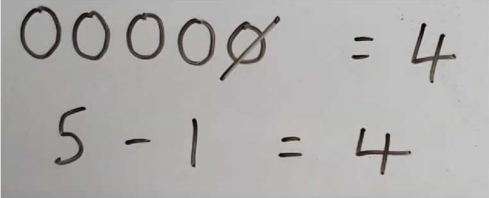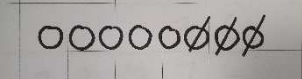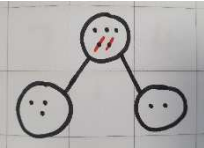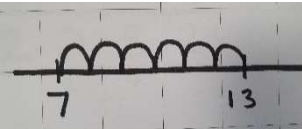
	Year 4
Calculation	Written Strategy
168 + 39 = 207	Children to record addition in columns, recording carrying over below:
3,456 + 278 = 3,3734	Children use column addition with up to 4-digit numbers:

	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: $$\begin{array}{r} 3\ 5\ 6\ 2\ 0\ 1\ 5 \\ +\ 2\ 4\ 3\ 1\ 5\ 3 \\ \hline 3\ 8\ 0\ 5\ 1\ 6\ 8 \\ \hline 1 \end{array}$$	
6.89 + 0.343 = 7.233	Children use column addition with decimals, using 0 place value holders: $$\begin{array}{r} 6\cdot8\ 9\ 0 \\ +\ 0\cdot3\ 4\ 3 \\ \hline 7\cdot2\ 3\ 3 \\ \quad 1\ \ 1 \end{array}$$	

Subtraction	**Early Years**
Calculation	Written Strategy
5 -1 = 4	Children draw the number of objects and then cross out the amount subtracting.

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

Subtraction	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 | 18 - 6 = 12 1 2
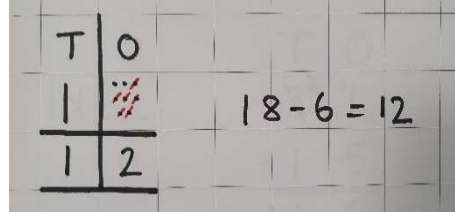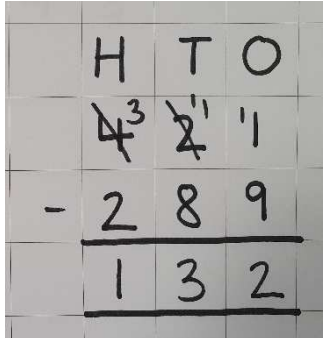
$64 - 21 = 43$	After becoming secure recording their answer pictorially (left), they begin to record their subtractions in column subtraction (right):
	
	T O T O
	      6 4
	4 3 - 2 1
	      4 3
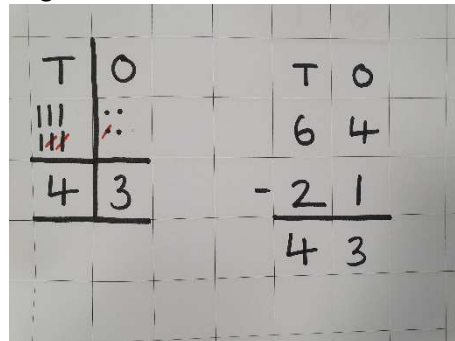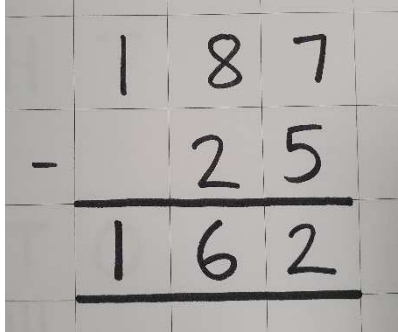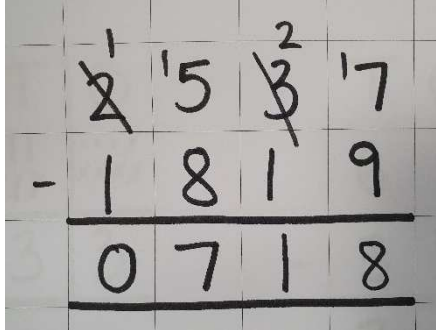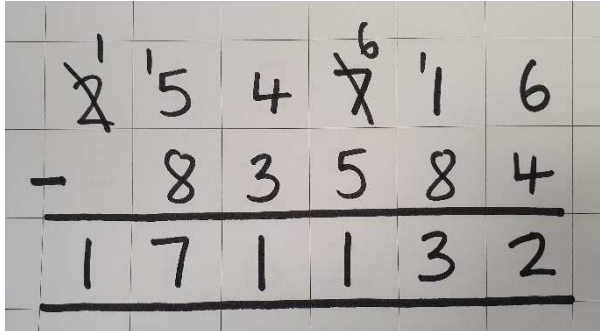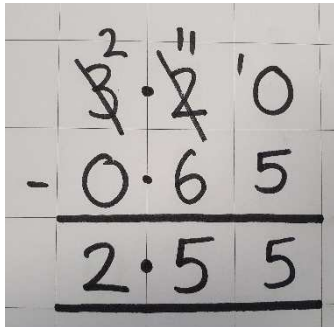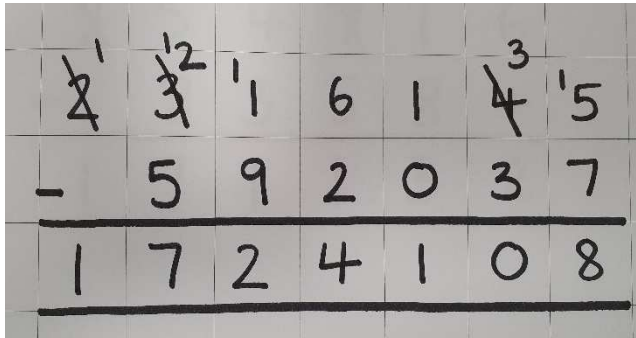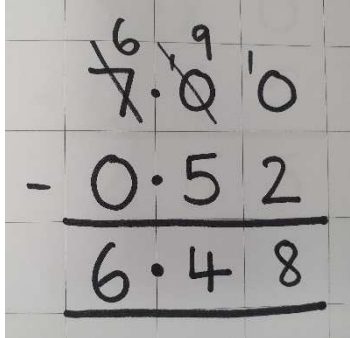
$31 - 15 = 16$	When the children become confident, they begin to use subtraction with exchanging:
	
	T O T O
	      3^2 1
	1 6 - 1 5
	      1 6

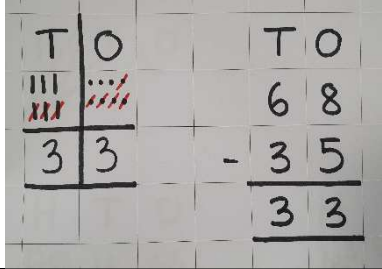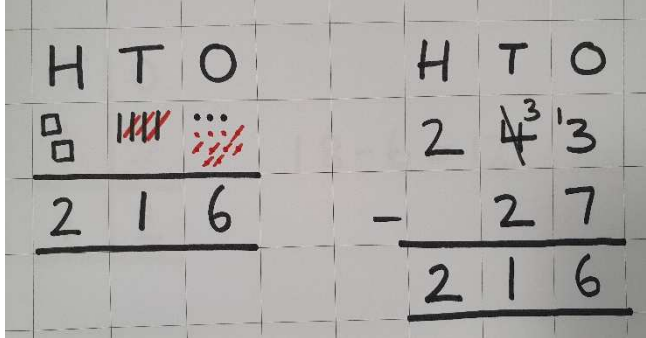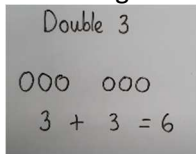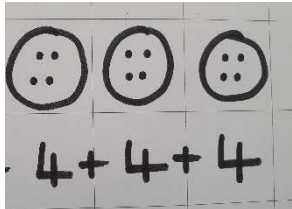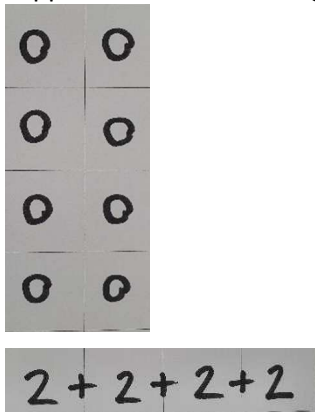| ![Subtraction]	**Year 3**
Calculation	Written Strategy
$68 - 35 = 33$	Children only record pictorially (left) at the very beginning of Year 3 to recap prior learning. Children to then only record abstract (right): T O T O III .::/ 6 8 XXX - 3 5 3 3 3 3
$243 - 27 = 216$	Children to use pictorial representation to become confident with column subtraction using 3-digit numbers including exchanging: H T O H T O □ IXXX .:: 2 4³ ¹3 □ - 2 7 2 1 6 2 1 6
$421 - 289 =$	Children to move to column subtraction without using pictorial representations: H T O 4³ 2̸¹¹ ¹1 - 2 8 9 1 3 2

	Year 4
Calculation	Written Strategy
$187 - 25 = 162$	Children to record subtraction in columns: $$\begin{array}{ccc} & 1 & 8 & 7 \\ - & & 2 & 5 \\ \hline & 1 & 6 & 2 \end{array}$$
$2{,}537 - 1{,}819 = 718$	Children use column subtraction with up to 4-digit numbers: $$\begin{array}{cccc} \cancel{2} & {}^1 5 & \cancel{3}^2 & {}^1 7 \\ - 1 & 8 & 1 & 9 \\ \hline 0 & 7 & 1 & 8 \end{array}$$

	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: $$\begin{array}{cccccc} \cancel{2}^1 & {}^1 5 & 4 & \cancel{7}^{6} & {}^1 1 & 6 \\ - & 8 & 3 & 5 & 8 & 4 \\ \hline 1 & 7 & 1 & 1 & 3 & 2 \end{array}$$
$3.2 - 0.65 = 2.55$	Children use column subtraction with decimals, using 0 place value holders: $$\begin{array}{ccc} \cancel{3}^2 . & \cancel{2}^{11} & {}^1 0 \\ - 0 . & 6 & 5 \\ \hline 2 . & 5 & 5 \end{array}$$

Subtraction	Year 6
Calculation	Written Strategy
$2,316,145 - 592,037$ $= 1,724,108$	Children use column subtraction as shown in Year 5:
$7 - 0.52 = 6.48$	Children use column subtraction with decimals, using 0 place value holders:

	Early Years
Calculation	Written Strategy
Double 3	Children are taught that doubling means adding two groups of the same amout together.

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

|	**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:
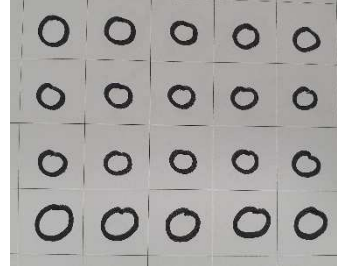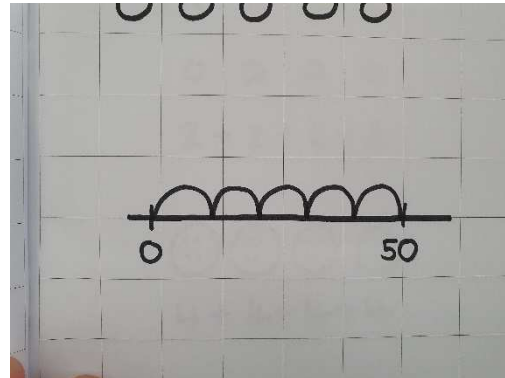
Multiplication	**Year 3**
Calculation	Written Strategy
21×3	Children will be taught to multiply numbers (TO x O) through partitioning and the formal written method of grid multiplication. This method will also help children to gain a solid understanding of multiplying a multiple of 10.
$83 \times 4 = 332$	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:

![Multiplication]	Year 4
Calculation	Written Strategy
$138 \times 4 = 552$	Children to record multiplication in expanded method, like Y3 for 2 and 3-digit numbers: ``` 1 3 8 x 4 ``` 3 2 1 2 0 + 4 0 0 5 5 2

Multiplication	**Year 5**
Calculation	Written Strategy
4,326 × 7	Children to move to formal short multiplication (compact) up to 4-digits: 4 3 2 6 × 7 3 0 2 8 2 2 1 4
43 × 25 = 1,075	Children taught long-multiplication method to up 4-digits: 4 3 × 2 5 2 1 5 + 8 6 0 1 0 7 5
136 × 27 = 3,672	1 3 6 × 2 7 9 5 2 + 2 7 2 0 3 6 7 2
2,756 × 43 = 118,508	2 7 5 6 × 4 3 8 2 6 8 1 1 0 2 4 0 1 1 8 5 0 8
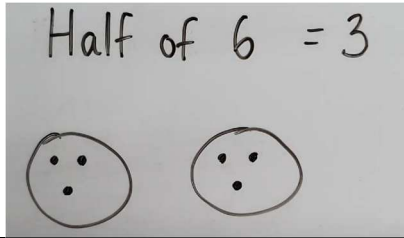
	Year 6
Calculation	Written Strategy
$3,829 \times 36$ $= 137,844$	Children use long multiplication as shown in Year 5:
$7 - 0.52 = 6.48$	Children use short multiplication as shown in Year 5, also using the strategy for decimal numbers:
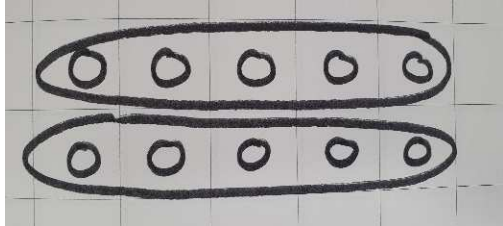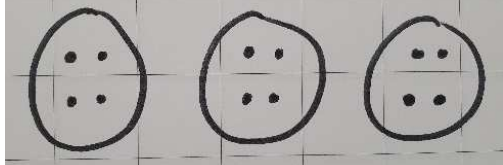
	Early Years
Calculation	Written Strategy
Half of 3	

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

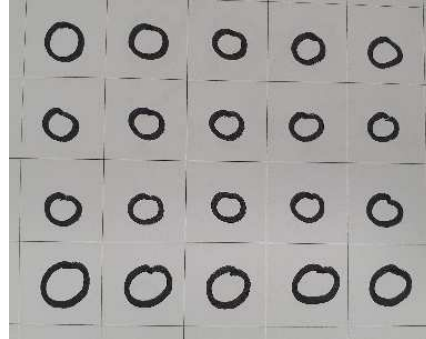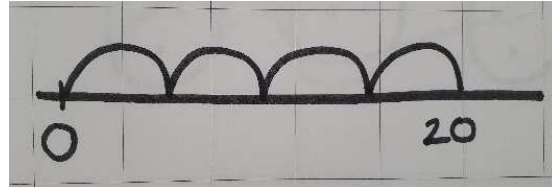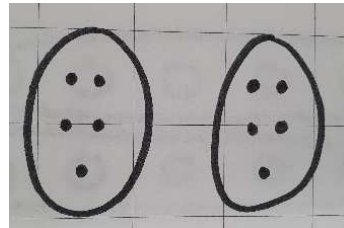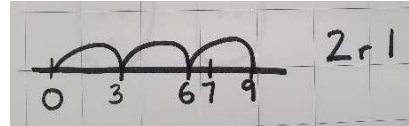|	**Year 2**
Calculation	Written Strategy
$15 \div 5 = 3$	Children will be able to represent a division calculation using an array and write the division within a number sentence:
$20 \div 5 = 4$	Children will use number lines to divide, to support formal short division in KS2 e.g. "how many groups of 5s in 20?":
$10 \div 2 = 5$	Children will use a written strategy to show how 10 is shared between 2.

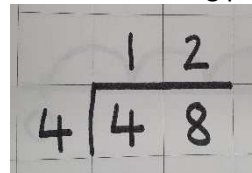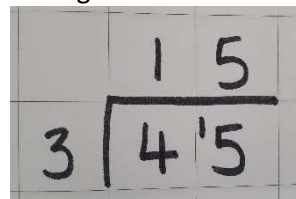| ➗ Division	Year 3
Calculation	Written Strategy
$17 \div 4 = 4r1$	Before formal short division is used, children will develop a solid understanding of remainders. E.g. "how many groups of 4 are in 17":
$7 \div 3 = 2r1$	
$48 \div 4 = 12$	Children are first taught short division method where there are 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':
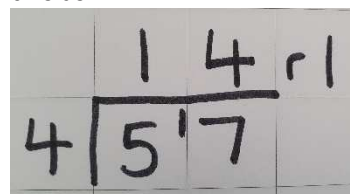
	Year 4
Calculation	Written Strategy
$268 \div 4 = 67$	Children to use short division as in Y3, for 2 and 3-digit numbers:
$295 \div 7 = 42r1$	Where there is a remainder at the end of the calculation, children note this as 'rX':

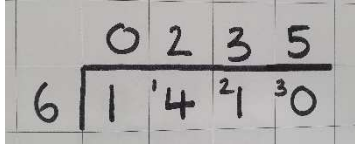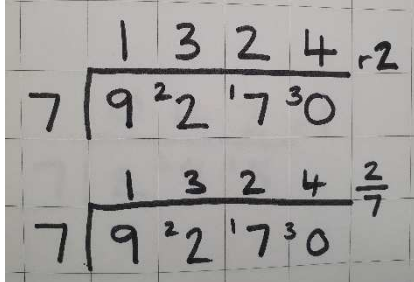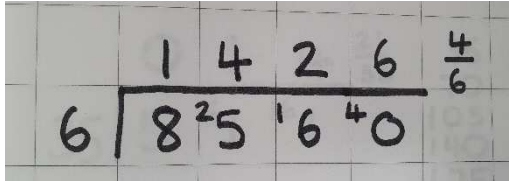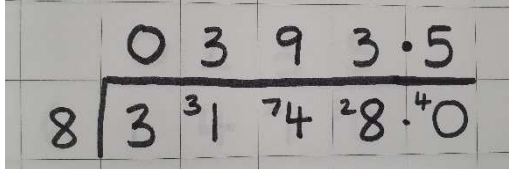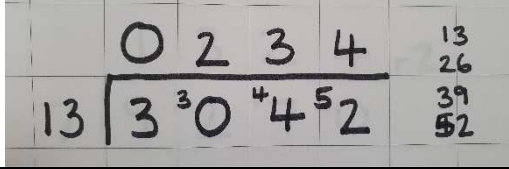| ![Division]	**Year 5**
Calculation	Written Strategy
$1{,}410 \div 6 = 235$	Children to use short division as in Y3, for up to 4-digit numbers: $\begin{array}{c} \,0\;2\;3\;5 \\ \hline 6\,|\,1\,{}^{1}4\,{}^{2}1\,{}^{3}0 \end{array}$
$9{,}270 \div 7 = 1{,}324\frac{2}{7}$	Children write remainders as 'rX', before moving to as fractions: $\begin{array}{c} \,1\;3\;2\;4\;{}_{r2} \\ \hline 7\,|\,9\,{}^{2}2\,{}^{1}7\,{}^{3}0 \end{array}$ $\begin{array}{c} \,1\;3\;2\;4\;\frac{2}{7} \\ \hline 7\,|\,9\,{}^{2}2\,{}^{1}7\,{}^{3}0 \end{array}$

![Division]	**Year 6**
Calculation	Written Strategy
$8{,}560 \div 6 = 1{,}426\frac{4}{6}$	Children use short division as in Year 5: $\begin{array}{c} \,1\;4\;2\;6\;\frac{4}{6} \\ \hline 6\,|\,8\,{}^{2}5\,{}^{1}6\,{}^{4}0 \end{array}$
$3{,}148 \div 8 = 393.5$	Children use short division as in Year 5 but using decimals to find remainders when appropriate: $\begin{array}{c} \,0\;3\;9\;3\cdot5 \\ \hline 8\,|\,3\,{}^{3}1\,{}^{7}4\,{}^{2}8\cdot{}^{4}0 \end{array}$
$3{,}042 \div 13 = 234$	Children divide by 2-digit numbers using the above short division strategy, noting down their times tables to support: $\begin{array}{cc} \,0\;2\;3\;4 & \begin{array}{l}13\\26\\39\\52\end{array} \\ \hline 13\,|\,3\,{}^{3}0\,{}^{4}4\,{}^{5}2 & \end{array}$
$511 \div 35 = 14\frac{21}{35}$	Children become confident when remainders moving through the division are more than 1 digit: $\begin{array}{cc} \,0\;1\;4\;\frac{21}{35} & \begin{array}{l}35\\70\\105\\140\\175\end{array} \\ \hline 35\,|\,5\,{}^{5}1\,{}^{16}1 & \end{array}$