Children will only be able to successfully carry out written multiplication and division if they are fluent with the times tables.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Benfieldside Primary School

written calculation
Document 2018/19

Written addition

column addition

	H	T	O
	1	4	7
+	2	3_1	8
	3	8	5

In the ones column 7 + 8 = 15
15 ones are the same as 1 ten and 5 ones, so you put a 5 in the ones column and the 1 ten goes into the tens column.

When dealing with numbers with different values you need to ensure the numbers are in suitable columns.

	H	T	O	.	ths
	3	5	7	.	6
+		2_1	2_1	.	5
	3	8	0	.	1

Success steps for written multiplication TO x TO

* Are your numbers in columns?
* Remember multiply all of the top number by the ones value in the bottom number.
* Have you passed over numbers to the top line?
* Have you added on any numbers you passed over?
* Does your second row end in a zero?
* in the 2nd line multiply **all** of the top number by the tens value in the bottom number.

Success steps for long division.

* At the side/bottom multiply the number you're dividing by: 10, then 20 (double), then 5 (half)
* Have you taken off the largest chunk you can?
* Remember to write down each chunk you take off.
* Remember any remainder you have has to be **smaller** than the number you are dividing by.

Success steps for short division.

* Remember you start at the **left** hand side.
* You have to work out how many times does the number you're dividing by go into the **each** value of the starting number.
* Remember you don't need to put a zero at the beginning of your answer.
* Have you remembered to pass over any of the number that wasn't used?
* If there is a number left to be passed over at the end, this is your remainder value (it has to be smaller than the number your are dividing by)
* *remainders can be represented as fractions*
* *remember to put .00 on the end if working with money*

Success Steps for written addition.

* Are the numbers in the correct columns?
* Remember you can only put a single digit in each column of your answer, the other digit has to be passed over.
* Have you added on any numbers that have been passed over?
* If needed, have you put the decimal point in your answer?

Success Steps for column subtraction

* Are the numbers in the correct columns?
* Have you put the decimal point in if you need one?
* Remember the number on top can't be smaller.
* Remember you can only transfer from the next column to the left.
* If you're exchanging and the next column is a zero, you need to change the zero to a ten and take one from the column to the left of the zero.
* If the numbers have a different number of decimals places, have you added zero's in the gap?

Success Steps for written multiplication TO x O

* Are your numbers in columns?
* Remember to start with the number furthest to the right.
* Remember multiply all of the top number by the ones value in the bottom number.
* Have you passed over numbers to the top line?
* Have you added on any numbers you passed over?

Written subtraction

column subtraction

	H	T	O
		5	
	~~6~~	¹2	7
-	2	8	4
	3	4	3

In Tens column 2 - 8 = -6 so take a hundred which is the same as 10 tens and put it in the tens column to leave 12 - 8 = 4

* Remember you can only exchange from the next column to the left, if the value to the left is a zero, you can't exchange from it so you take one from the next value to the left and change the zero to a ten, which can then be exchanged from.

	H	T	O
	~~4~~	~~9~~	¹
	5	0	3
-	2	6	5
	2	3	8

Written Multiplication

compact method

TO
3**6**
x 2 **4**
14**4**

In the ones column 6 x 4 = 24, 24 is the same as 2 tens and 4 ones, so the 4 goes in the ones and the 2 Is carried over to the tens column. In the Tens column 3 x 4 = 12, plus the two that had been passed over makes 14.

When multiplying TO by TO, you use the same method but the second line needs to end in a zero.

TO
36
x 24
1 2
144
72**0**
864

36 x 4 = 144
36 x 2**0**, (20 = 2 x 1**0** , apply PV knowledge and put a zero In the 2nd line then do 36 x 2

Written Division

Chunking

887 ÷ 34 = 26 r 3

887
- 680 (20 x 34)
207
- 170 (5 x 34)
37
- 34 (1 x 34)
3

We use our knowledge of multiplying by ten and doubling and halving to allow us to take off bigger chunks.

5 x 34 = 170 (half)
10 x 34 = 340 (x 10)
20 x 34 = 680 (double)

applying knowledge of tables to divide by a single digit

1 2 2 r 2
1 1
7 | 8 5 6

856 ÷ 7 = 122 r2

There is 1 seven in eight with one left over, so it gets carried to the next column to make 15 (because 1 hundred is the same as 10 tens). There are 2 sevens in fifteen with one left over etc.

This method is only appropriate for dividing by single digit numbers when the children are confident with all the times tables.