

Addition +

Columnar Addition (Column Method)

	2	3	4	8	9	7													
+		4	5	9	9	6													
	2	8	0	8	9	3													
		1	1	1	1														

	1	4	8	6	6	0													
	0	2	6	9	0	0													
+	0	0	9	7	8	3													
	1	8	5	3	4	3													
		2	2	1															

1. Line up the digits in columns, one digit per box, adding zeros as place holders if necessary.
2. Beginning on the right with the digits that have the lowest value, find the total of each column, ensuring carried digits are recorded below the line and referred to as 'carry a hundredth' 'carry ten' 'carry one hundred' etc.

The red zeros represent place holders. Having zeros as place holders and using the decimal point to line up digits serves to limit errors involving place value in written methods.

Subtraction –

Columnar Subtraction (Column Method)

	1	2	3	4	1	8	9	7											
-		4	5	9	9	6													
	1	8	8	9	0	1													

	1	6	7	10	12	1	0	km											
-		3	2	8	7	km													
	1	3	8	4	3	km													

1. Line up the digits in columns, one digit per box, adding zeros as place holders if necessary.
2. Beginning on the right with the digits that have the lowest value, subtract the subtrahend (bottom number) from the minuend (top number), regrouping as necessary.

Use correct place value in 'teacher talk' when modelling the method (e.g. 90 minus 90 equals zero / we know 13 subtract 5 is 8 so 13 000 subtract 5000 equals 8000 etc.)

Multiplication ×

Short Multiplication

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

When using the column method for short multiplication, multiply each digit of the multiplicand by the multiplier starting from the right, so in the example shown, the first step is $\frac{6}{100} \times 5$. Any digits carried over are recorded below the line to be added on once the next digit of the multiplicand has been multiplied by the multiplier.

Long Multiplication

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

For this method, each digit of the multiplicand is first multiplied by the ones digit in the multiplier, following the same method for short multiplication.

Then, before multiplying each digit in the multiplicand by the tens digit in the multiplier, a zero is added in the next row to ensure we begin in the tens column as, in this example, we are multiplying by 40, so $2 \times 40 = 80$.

The two numbers are then combined to find the answer.

Division ÷

Short Division

	0	2	1	3	r	5													
1	4	2	9	8	7														

Work out how many times the divisor will divide into each digit of the dividend, starting from the left, carrying over any remainders.

Long Division - Repeated Subtraction (Chunking)

	2	3	5	r	5														
4	2	9	8	7	5														
		8	4	0	0	(4 2 x 2 0 0)													
		1	4	7	5														
			8	4	0	(4 2 x 2 0)													
			6	3	5														
			4	2	0	(4 2 x 1 0)													
			2	1	5														
			2	1	0	(4 2 x 5)													
					5														

In this method, to calculate 9875 divided by 42, subtract multiples of 42 until zero or a number less than 42 – this would be the remainder - is reached. A record must be kept of how many lots of 42 were taken away to give the answer.

Encourage pupils to reduce the number of steps and move them on quickly to finding the largest possible multiples to make the process efficient.

Pupils must be taught to present remainders as fractions and decimals as well.