Progression in Addition

Year	What will addition look like?	Guidance
EYFS	Practical, counting objects and relating addition to combining two groups of objects	
1	Use of the number track and number line - hopping and recording. (a) 2 and 3 equals 5 0 1 2 3 4 5 6 7 8 9 10 Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example, 9 + 7 = 16; 16 − 7 = 9; 7 = 16 − 9). They should realise the effect of adding or subtracting 0. This establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards. $2 + 3 = \square$ $5 + 3 + 1 = 9$ $\square + \triangle = 4$ $10 = 6 + \triangle$ Continue to develop pupils' understanding of addition with practical activities using concrete apparatus, such as bundles of straws, numicon, counters and diennes. To know bonds to 20.	*Pupils memorise and reason with number bonds to 10 and 20 in several forms (e.g. 9 + 7 = 16; 16 - 7 = 9; 7 = 16 - 9). They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards.* *They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms put together, add, altogether, total, take away, distance between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.*

2	Pupils should be taught to:
	
	 • solve problems with addition and subtraction:
	     ○ using concrete objects and pictorial representations, including those involving numbers, quantities and measures
	     ○ applying their increasing knowledge of mental and written methods
	 • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
	 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
	     ○ a two-digit number and 1s
	     ○ a two-digit number and 10s
	     ○ 2 two-digit numbers
	     ○ adding 3 one-digit numbers
	 • show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
	 • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
		Pupils extend their understanding of the language of addition and subtraction to include sum and difference
		 Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10, 10 - 7 = 3 and 7 = 10 - 3 to calculate 30 + 70 = 100, 100 - 70 = 30 and 70 = 100 - 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (e.g. 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition.
		 Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.

Pupils continue to use the number line to calculate with bigger numbers, partitioning the smaller number and adding the most significant digit first

(a) 52 + 24

+20   +4
52   72   76
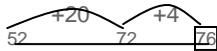
(b) 61 + 14 = □

(c)   12 + 7 + 4 = □

When children have a good understanding of place value and partitioning, introduce the columnar methods with additions that do not cross the tens boundary using concrete apparatus laid out in a columnar form.

34 + 22 =
Formally calculate by using expanded column

```
   34
+  22
    6
   50
   56
```

Progress to Efficient column.

```
   34
+  22
   56
```

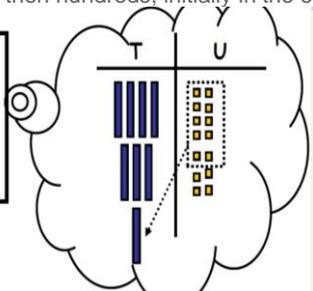|		
3	(a) Pupils continue to use the number line to support mental calculation +50 +4 +3 86 + 57 86 136 140 143 Pupils build on their understanding of place value, partitioning and their concrete experiences to develop columnar methods of addition which bridge the tens, then hundreds, initially in the expanded form. ``` 67+ 83 + 24 42 11 5 80 120 91 125 and check answer ```	*Pupils practise solving varied addition and subtraction questions. For mental calculations with two-digit numbers, the answers could exceed 100.* *Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent*

3	Pupils should be taught to:
	
	 • add and subtract numbers mentally, including:
	   ○ a three-digit number and 1s
	   ○ a three-digit number and 10s
	   ○ a three-digit number and 100s
	 • add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
	 • estimate the answer to a calculation and use inverse operations to check answers
	 • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
	
	3 digit numbers Colum.
	
	124+
	137
	261
	 1	

4	Pupils should be taught to:
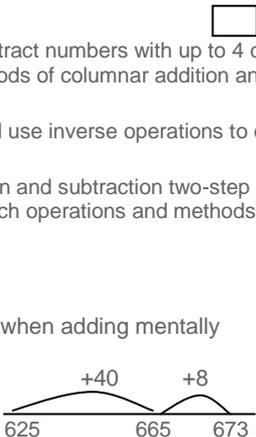	
	 • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
	 • estimate and use inverse operations to check answers to a calculation
	 • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
	
	Partition one number when adding mentally
	(a) 625 + 48 =
	
	    +40 +8
	  625 665 673
	
	Pupils use their understanding of the expanded columnar methods of addition to progress to use the compact method.
	
	 625 +
	   48
	 673
	  1
	
	 1294+
	 2345
	 3639
	  1
		Pupils continue to practise both mental methods and columnar spacing addition and subtraction with increasingly large numbers to aid fluency.

5	Pupils should be taught to: • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step pr deciding which operations and methods to ι	*Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency* *They practise mental calculations with increasingly large numbers to aid fluency.*

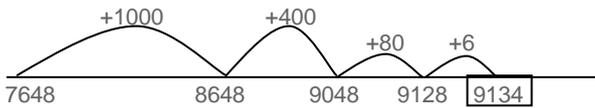Adding larger numbers mentally, partitioning the smaller number
587 + 475 =

```
                 +400
                              +70      +5
       587                   987     1057  1062
```
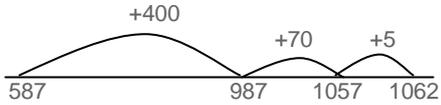
Pupils use the compact column method to calculate with decimal numbers, and with larger whole numbers.

```
£   6.72 +
    8.56
+   2.30
£  17.58
```

6

Adding larger numbers mentally, supported by the number line, partitioning the smaller number
(a) 7648+1486 =

```
        +1000          +400
                                  +80     +6
     7648            8648       9048    9128   9134
```

Pupils add larger whole numbers using the columnar method. They add decimals with differing numbers of decimal places using the columnar method. Pupils may fill empty columns with zeros initially, to preserve place value.

```
(a)   7648        (b)  124.9 + 7.25
    + 1486                124.90
      9134              +   7.25
      111                 132.15
                            11
```

To be able to add two numbers up to 10,000,000

Pupils practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction.
They undertake mental calculations with increasingly large numbers and more complex calculations.