Progression in Addition
National Curriculum 2014

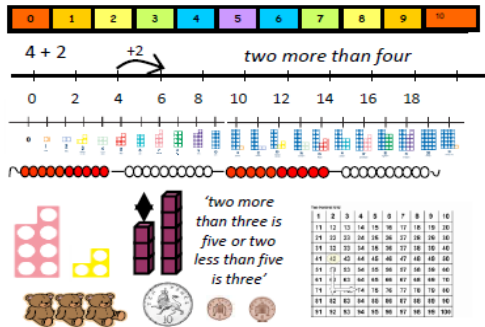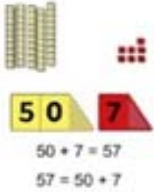| Year	What will addition look like?	Guidance
		The guidance in italics is taken from the non-statutory guidance in the 'National Curriculum in England' document for 2014
EYFS	Practical, counting objects and relating addition to combining two groups of objects **Nursery** **Count on in familiar and practical contexts** Songs, rhymes and stories: 1,2,3,4,5 once I caught a fish alive… 0 1 2 3 4 5 6 7 8 9 10 **Relate addition to combining two groups of objects** 3 and 2 more is 5 **Reception** **Put biggest number first and count on.** Using numbers on a washing line or jumping along a number track 0 1 2 3 4 5 6 7 8 9 10 **Use a number track to count on.** **Begin to use + and = sign to record mental calculations in a number sentence.** 3 3+ 2:5 2. Using Numicon to support Addition **If using Numicon, children could use printed Numicon icons and stick these in - progressing to recording number sentences alongside** $1 + 2 = 3$	
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 $2 + 3 = \square$ $\qquad$ $5 + 3 + 1 = 9$ $\square + \triangle = 4$ $10 = 6 + \triangle$ Continue to develop pupils' understanding of addition with practical activities using concrete apparatus, such as bundles of straws, numicon, counters and diennes.	*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.*

Number lines to add units

26 + 5 =

24 25 26 27 28 29 30 31 32 33

Begin to use number lines to bridge across 10 to solve additions

8 + 5 =

7 8 9 10 11 12 13 14 15 16
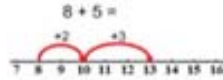
Partition numbers and write the addition using + and =, using dienes and place value arrows

50 + 7 = 57

57 = 50 + 7

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

4 + 2   +2   two more than four

0   2   4   6   8   10   12   14   16   18

'two more than three is five or two less than five is three'

Use practical resources such as bears, counters, cubes and number lines/hundred grids and progress to a resource such as Numicon to encourage counting in groups rather than ones

FLUENCY

Count forwards, to and across 100, beginning with 0 or 1 or from any given number.

Switch count between tens and ones e.g. 10, 20, 30, 31, 32, 33 …

Represent and use number bonds up to 20 (establish addition and subtraction as related operations)
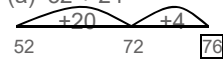
Find one more than a number

Find ten more than a number

Count in multiples of 2s, 5s and 10s starting on multiples to highlight pattern recognition.

2

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   (b) 61 + 14 = ☐

    +20   +4
52   72   76

(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.


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.
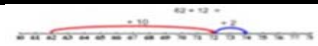
Children use empty number lines to add tens and units. They use these to bridge through multiples of 10 using their number bond knowledge
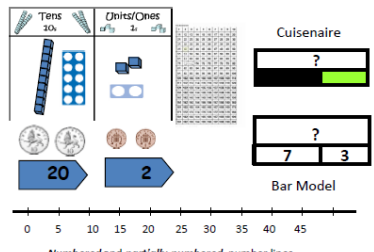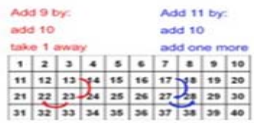
$45 + 28 =$

$73 + 8 =$
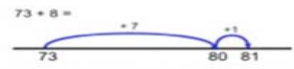
Children begin to partition two digit numbers horizontally and then begin to add tens and units vertically

$37 + 22 =$
$30 + 7$
$20 + 2$
$50 + 9 = 59$

Children use a number square to add 10 and multiples of 10.

Children begin to use a number square to add 9 and 11.

Add 9 by:
add 10
take 1 away

Add 11 by:
add 10
add one more

Tens 10s | Units/Ones 1s

20 | 2

Cuisenaire

? | black / green

? | 7 | 3

Bar Model

0 5 10 15 20 25 30 35 40 45

Numbered and *partially numbered* number lines
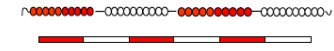
Use Numicon, number grids, place value apparatus/Dienes, place value grids, place value cards, Encourage children to partition numbers rather than counting in ones.
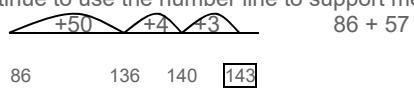

3

(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.

Expanded method

It is important that the children have a good understanding of place value and partitioning using concrete resources and visual images to support calculations. The expanded method enables children to see what happens to numbers in the standard written method.

$48 + 36$

$60 + 7$
$20 + 4$
10
$90 + 1 = 91$
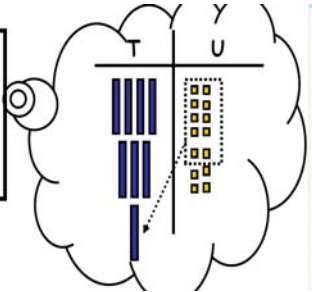
and check answer using the inverse

Progressing to 3 digit numbers

124+

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

<u>137</u>
 11(ones)
 50 (tens)
<u>200</u> (hundreds)
<u>261</u>

and check answer using the inverse

<u>Children to be confident using the practical apparatus to support if necessary.</u>

Count in ones, tens and hundreds maintaining fluency through varied and frequent practice
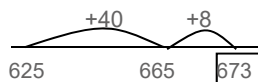
Count from 0 in multiples of 4,8,50 and 100

Find 10 or 100 more than a number
Mentally add HTO + O, HTO + tens, HTO + hundreds

Perform mental calculations with two-digit numbers, the answer could exceed 100

Partition one number when adding **mentally**
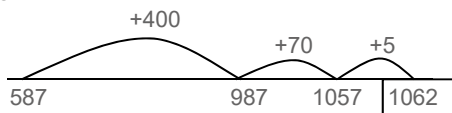(a)   625 + 48 =

        +40   +8

    625   665   673

Pupils use their understanding of the expanded columnar methods of addition to progress to use the compact method.

    625 +
     <u>48</u>
    <u>673</u>
      1

    1294+
    <u>2345</u>
    <u>3639</u>
       1

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.
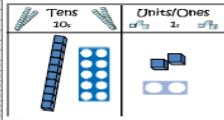   £ 6.72 +
        8.56

Pupils continue to practise both mental methods and columnar spacing addition and subtraction with increasingly large numbers to aid fluency.

Pupils practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency
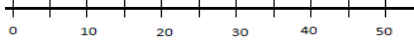*They practise mental calculations with increasingly large numbers to aid fluency.*

4

+ 2.30
£ 17.58

Children to be confident using the practical apparatus to support if necessary.

Hundreds 100s | Tens 10s | Units/Ones 1s

100 10 1 1 1

100 10 3

Partially numbered **and** blank number lines

Cuisenaire

Bar Model

Count in 6s, 7s, 9s, 25s and 100s

Find 1000 more than a number

Perform mental calculations with increasingly large numbers to aid fluency