Year 2

NUMBER AND PLACE VALUE

To add, subtract, multiply and divide successfully, pupils need to:

- read and write numbers to at least 100 in numerals and in words
- count in steps of 2, 3, and 5 from 0, and in tens from any number, forwards and backwards
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use <, > and = signs

ADDITION

Conceptual understanding and procedural fluency

To add successfully, pupils need to:

- recall and use addition facts to 20 fluently, and derive and use related facts up to 100, including adding two multiples of 10, e.g. 30 + 50
- add numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one 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
- record addition in columns to support place value and prepare for the formal written method with larger numbers

Reason mathematically and solve problems

Pupils need to use and apply their understanding of, and fluency in, addition to:

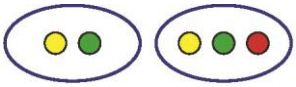
- solve problems with addition:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental and written methods

Year 2

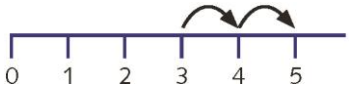
ADDITION Continued

Mental strategies

- Use of models and images:
  - concrete objects/pictorial representations



  - number tracks and number lines

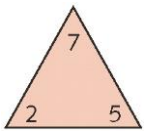


  - 1–100 number square

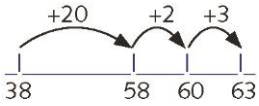
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

  - trios

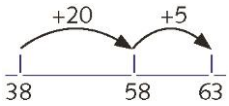
5 + 2 = 7
2 + 5 = 7
7 – 2 = 5
7 – 5 = 2



  - empty number line



leading to:



  - addition and subtraction tables

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

+	11	12	13	14	15	16	17	18	19	20
0	11	12	13	14	15	16	17	18	19	20
1	12	13	14	15	16	17	18	19	20	
2	13	14	15	16	17	18	19	20		
3	14	15	16	17	18	19	20			
4	15	16	17	18	19	20				
5	16	17	18	19	20					
6	17	18	19	20						
7	18	19	20							
8	19	20								
9	20									

- Use knowledge that addition can be done in any order (commutative), e.g.
  - put the larger number first and count on in tens or ones
  - add three small numbers by putting the largest number first and/or find a pair totalling 10

Year 2

ADDITION Continued

Mental strategies continued

- Partition additions into tens and ones, then recombine, e.g.

38 + 25 = 30 + 20 + 8 + 5
= 50 + 13
= 63

38 + 25 = 38 + 20 + 5
= 58 + 5
= 63

38 + 25

30 + 8
+ 20 + 5
50 + 13 = 63

- Identify near doubles, using doubles already known (e.g. 7 + 8, 30 + 31)
- Add a 'near multiple of 10' to a two-digit number by adding 10, 20, 30 and adjusting
- Recognise and use patterns of similar calculations (e.g. 10 + 0 = 10, 9 + 1 = 10, 8 + 2 = 10 ...)
- Understand and use the inverse relationship between addition and subtraction

Written methods

- Add two two-digit numbers: TO + TO (where answers do not exceed 100)

Expanded written method

38 + 25

```
  38
+ 25
  13
  50
  63
```

Record addition calculations in columns to support place value and prepare for the formal written method of columnar addition with larger numbers.

The first stage in the written method shows separately the addition of the ones to the ones and the tens to the tens. To find the partial sums either the ones or the tens can be added first, and the total of the partial sums can be found by adding them in any order. Children should be encouraged to start by adding the ones digits first (the least significant digits), as this echoes the formal written method.

The addition of the tens in the calculation 38 + 25 is described in the words 'thirty add twenty equals fifty', stressing the link to the related fact 'three add two equals five'.

Where appropriate, place value columns are labelled, e.g. TO, to remind children of the value of each of the digits.

Year 2

SUBTRACTION

Conceptual understanding and procedural fluency

To subtract successfully, pupils need to:

- recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100, including subtracting two multiples of 10, e.g. 80 – 30
- subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one 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
- record subtraction in columns to support place value and prepare for the formal written method with larger numbers

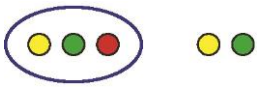
Reason mathematically and solve problems

Pupils need to use and apply their understanding of, and fluency in, subtraction to:

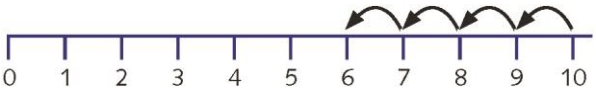
- solve problems with subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental and written methods

Mental strategies

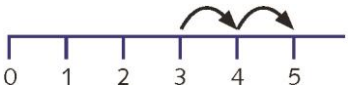
- Use of models and images:
  - concrete objects/pictorial representations



  - number tracks and number lines: 'take away' (counting back)



'finding the difference' (counting up)



  - 1–100 number square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

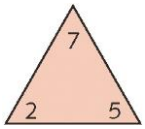
Year 2

SUBTRACTION Continued

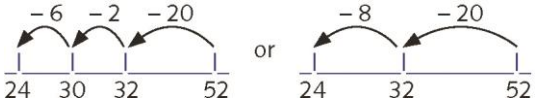
Mental strategies continued

- trios

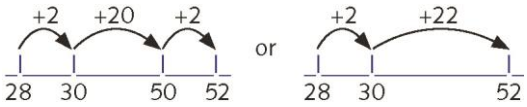
5 + 2 = 7
2 + 5 = 7
7 – 2 = 5
7 – 5 = 2



- empty number line: 'take away' (counting back)



'finding the difference' (counting up)



- addition and subtraction tables

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

+	11	12	13	14	15	16	17	18	19	20
0	11	12	13	14	15	16	17	18	19	20
1	12	13	14	15	16	17	18	19	20	
2	13	14	15	16	17	18	19	20		
3	14	15	16	17	18	19	20			
4	15	16	17	18	19	20				
5	16	17	18	19	20					
6	17	18	19	20						
7	18	19	20							
8	19	20								
9	20									

- Find a small difference by counting up from the smaller to the larger number, e.g. 51 – 4
- Subtract a 'near multiple of 10' from a two-digit number by subtracting 10, 20, 30 and adjusting
- Recognise and use patterns of similar calculations (e.g. 10 – 0 = 10, 10 – 1 = 9, 10 – 2 = 8 ...)
- Understand and use the inverse relationship between addition and subtraction
- Use partitioning, e.g.

52 – 28 = 52 – 20 – 8
= 32 – 8
= 24

Written methods

- Subtract two two-digit numbers: TO – TO (that do not require decomposition)

87 – 32

$$\begin{array}{r} 87 \\ -\ 32 \\ \hline 55 \end{array}$$

Record subtraction calculations that do not require decomposition in columns to support place value and prepare for formal written methods of columnar subtraction with larger numbers.
Where appropriate, place value columns are labelled, e.g. TO, to remind children of the value of each of the digits.

Year 2

MULTIPLICATION

Conceptual understanding and procedural fluency

To multiply successfully, pupils need to:

- recognise multiplication as repeated addition
- recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs

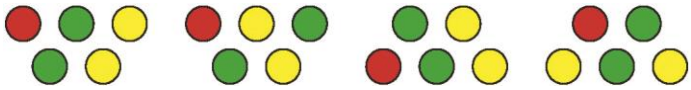
Reason mathematically and solve problems

Pupils need to use and apply their understanding of, and fluency in, multiplication to:

- solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts

Mental strategies

- Use of models and images:
  - concrete objects/pictorial representations

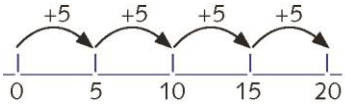


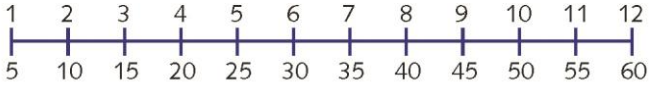
  - arrays

4 × 5 = 20

5 × 4 = 20

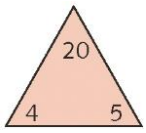
  - number lines





  - trios

4 × 5 = 20
5 × 4 = 20
20 ÷ 5 = 4
20 ÷ 4 = 5



  - multiplication and division table

×	2	5	10
1	2	5	10
2	4	10	20
3	6	15	30
4	8	20	40
5	10	25	50
6	12	30	60
7	14	35	70
8	16	40	80
9	18	45	90
10	20	50	100
11	22	55	110
12	24	60	120

Year 2

MULTIPLICATION Continued

Mental strategies continued
• Make connections between arrays, number patterns and counting in steps of a constant size • Understand and use the inverse relationship between multiplication and division, including doubling and halving

Year 2

DIVISION

Conceptual understanding and procedural fluency

To divide successfully, pupils need to:

- recognise division as grouping or sharing
- recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- understand the link between division and fractions, and find fractions of a length, shape, set of objects or quantity
- calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs

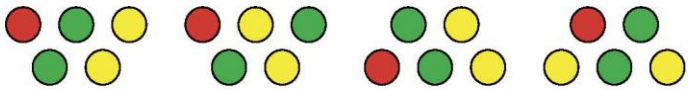
Reason mathematically and solve problems

Pupils need to use and apply their understanding of, and fluency in, division to:

- solve problems involving division, using materials, arrays, repeated addition and subtraction, mental methods, and division facts, including problems in contexts

Mental strategies

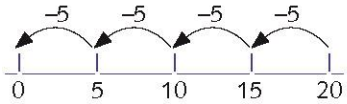
- Use of models and images:
  - concrete objects/pictorial representations

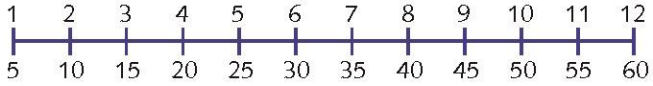


  - arrays

20 ÷ 5 = 4
20 ÷ 4 = 5

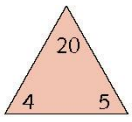
  - number lines





  - trios

4 × 5 = 20
5 × 4 = 20
20 ÷ 5 = 4
20 ÷ 4 = 5



Year 2

DIVISION Continued

Mental strategies continued

- multiplication and division table

×	2	5	10
1	2	5	10
2	4	10	20
3	6	15	30
4	8	20	40
5	10	25	50
6	12	30	60
7	14	35	70
8	16	40	80
9	18	45	90
10	20	50	100
11	22	55	110
12	24	60	120

- Make connections between arrays, number patterns and counting in steps of a constant size
- Understand and use the inverse relationship between multiplication and division, including doubling and halving