Dimple Well Infant School and Nursery

Calculation Policy
Reviewed 2019 / 2020

Dimple Well Infant and School and Nursery - Calculation Methods and Strategies – Addition

	Year 1	Year 2
Mental Addition	Number Bonds – being able to learn off by heart all the pairs of numbers that total 5, 6, 7, 8, 9 and 10 (e.g. 5 + 0, 4 + 1, 3 + 2) Count on in ones from a given 2-digit number (e.g. 18) Add two single-digit numbers (e.g. 7 + 5) Add three single-digit numbers spotting doubles or pairs to 10 (e.g. (3 + 7) + 2, (5 + 5) + 4) Count on in tens from any given 2-digit number Add 10 to any given 2 –digit number Use number facts to add single-digit numbers to two-digit numbers e.g. use 4 + 3 to work out 24 + 3, 34 + 3 etc. Add by putting the larger number first.	Number bonds – knowing all the pairs of numbers which make all the numbers to 5,10,12 and pairs with a total of 20 and related facts to 100 – multiples of 10 i.e. 8 + 2 = 10, so 80 + 20 = 100 Count on in ones and tens from any given 2 – digit number Add two or three single-digit numbers Add a single-digit number to any 2-digit number using number facts, including bridging multiples of 10 (e.g. 45 + 4, 38 + 7) Add 10 and small multiples of 10 to any given 2 digit number Add any pair of 2-digit numbers

Written Addition

+ = signs and missing numbers

Children need to understand the concept of 'equal to' before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'.

2+1 =1
2+3 = 4 + 1
3=3
2+2+2=4 +2

Missing numbers need to be placed in all possible places.

3 + 4 = ☐   **☐ = 3 +4**
3 + ☐= 7   **7 = ☐ + 4**
☐ + 4 = 7   **7 = 3 + ☐**
☐ +▽ = 7   **7 =▽ +**

The Number line

Children use a numbered line to count on in ones. Children use number lines and practical resources to support calculation and teachers demonstrate the use of the number line.
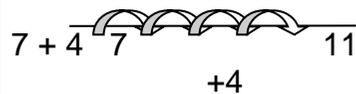
7 + 4 7   11   N.B Numicon tiles can be
          +4   used across KS1 to aid
                                  investigation and
                                  understanding.

Pairs with a total of 10
Counting in ones
Counting in tens
Count on 1 from any given 2 digit number

As with Year 1 but with appropriate, larger numbers.
Extend to
14 + 5 = 10 + ☐
33 + ☐ + ☐ = 100

Partition into tens and ones and recombine
12 + 23 = 10 + 2 + 20 + 3
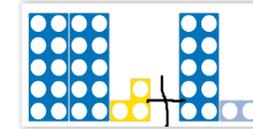   = 30 + 5
          = 35

Count on in tens and ones
23 + 12 = 23 + 10 + 2
          = 33 + 2
          = 35

+ = signs and missing numbers
Continue using a range of equations as Year 1

The Empty Number Line: Partitioning and bridging through 10

The steps in addition often bridge through a multiple of 10 e.g. Children should be able to partition the 7 to relate adding the 2 and then the 5.   8 + 7 = 15

Add 9 or 11 by adding 10 and adjusting by 1
e.g.
Add 9 by adding 10 and adjusting by 1
35 + 9 = 44   SO   35 + 10 = 45
                                  45 – 1 = 44

Dimple Well Infant School and Nursery Calculation Methods and Strategies – Subtraction

|	Year 1	Year 2
Mental Subtraction	Number bonds for 5, 6, 7, 8, 9 and 10 (e.g. learn by heart 5 - 1= 4, 5 – 2 = 3, 5 – 3 = 2, 5 – 4 = 1, 5 – 5 = 0) Count back in ones from a given 2-digit number (e.g. count back from 67, count back from 72) Subtract one single-digit number from another (e.g. 9 – 6 = 3, 8 – 4 =) Count back in tens from any given 2-digit number (e.g. 76, 66, 56, 46, 36, 26, 16, 6) Subtract 10 from any given 2-digit number (35 – 10 = 25, 47 – 10 = 37) Use number facts to subtract single-digit numbers from two-digit numbers, e.g. use 7 – 2 to work out 27 – 2, 37 – 2 …	Number bonds – knowing all the pairs of numbers which make all the numbers to 12 Count back in ones and tens from any given 2-digit number (e.g. count back from 67 in 1s, count back from 72 in 10s) Subtract a single-digit number from any 2-digit number using number facts, including bridging multiples of 10, e.g. 56 – 3, 53 – 5. Subtract 10 and small multiples of 10 from any given 2-digit number Subtract any pair of 2-digit numbers by counting back in tens and ones or by counting up.

Written Subtraction

Use practical equipment

Remove the number to be taken away

Touch count and remove the number to be taken away, in this case 4

4 3 2 1

1 2 3 4 5 6 7 8 ← 9
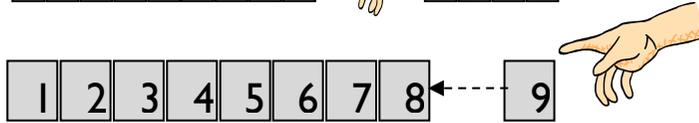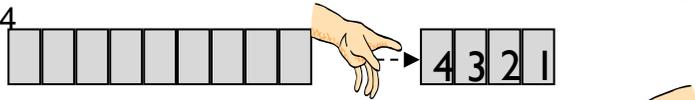
Children use Base Ten for counting and taking away.

Counting back

Jump back 5, jump back 3   15 – 8 = 7
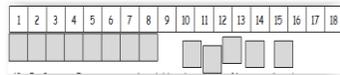
7   10   15
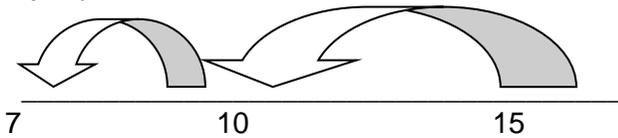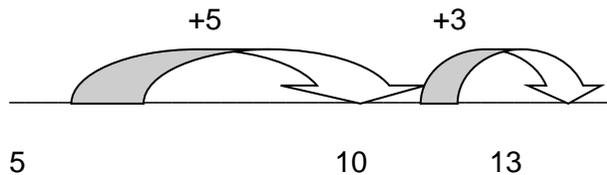
Pairs with a total of 10
Counting back in ones from 20 to 0
Counting back in tens from 100 to 0
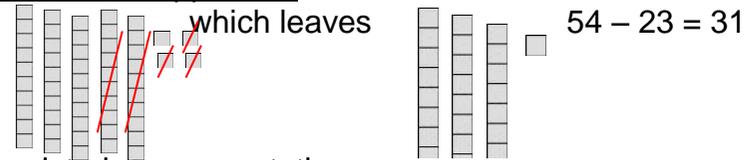Counting back 1 from any given 2 digit number

Counting on
13 – 5 =

+5   +3

5   10   13
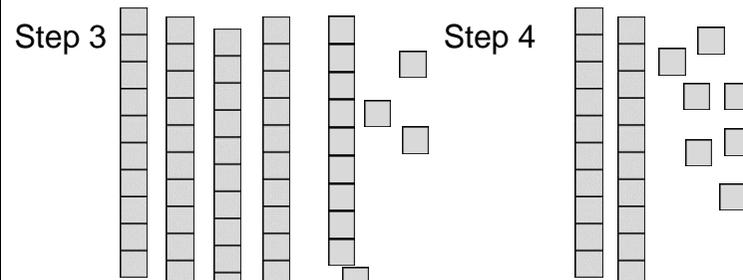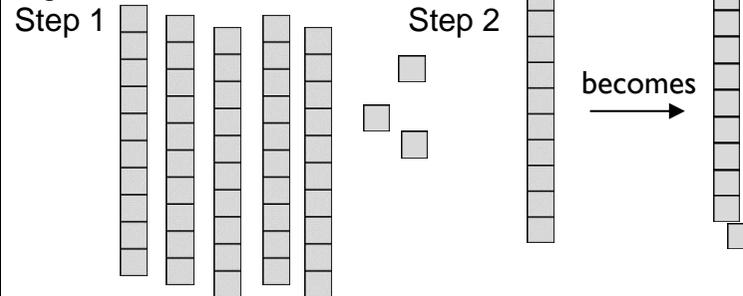
Use concrete apparatus

which leaves   54 – 23 = 31

Use pictorial representations

When the amount of units to be subtracted is greater than the units in the original number
e.g. 53 - 26

Step 1   Step 2   becomes

Step 3   Step 4

Children will move on to using the NUMICON equipment to support their calculations. They need to understand that the number being subtracted covers parts of the number it is being subtracted from and that they can see what is left as the DIFFERENCE.

NUMBERLINE AS IN YEAR 1 FOR LESS ABLE.

Dimple Well Infant and Nursery School Calculation Methods and Strategies – Multiplication

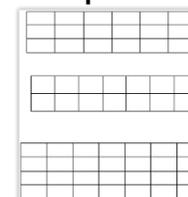|	Year 1	Year 2
Mental Multiplication	Begin to count in 2s, 5s and 10s. Begin to say what three 5s are by counting in 5s or what four 2s are by counting in 2s, etc. Double numbers up to 10 Children will use practical equipment to make groups of objects to represent multiplication. They should see everyday versions of arrays, e.g. egg boxes, baking tray, ice cubes tray, wrapping paper etc. and use this in their learning answering questions such as 'How many eggs would we need to fill the egg box? 'How do you know?'	**Counting in steps – sequences** Count in 2s, 5s and 10s Begin to count in 3s Begin to understand that multiplication is repeated addition and to use arrays (e.g. 3 x 6 is three rows of 6 squares or counters) Begin to learn 2x, 3x, 5x and 10 x tables, seeing these as 'lots of', e.g. 5 lots of 2, 6 lots of 2, 7 lots of 2 etc. Double numbers up to 20 Begin to double multiples of 5 and 100 Recognition of Odd and Even numbers

Written Multiplication

Repeated addition

This modelled by the teacher and then shown as a multiplication number sentence. The child experiences the format of formal recording.
e.g. 2 + 2 + 2 + 2 = 8 is also shown as 4 x 2 = 8 and is 'SWITCHED' to show 2 x 4 = 8


Children should utilise multiplication as repeated addition – linked to arrays (as this knowledge will support with the development of the column method). They should also use jottings to support their calculation. These should be supported by the use of counters/cubes/Numicon.

Children should understand and be able to calculate multiplication as repeated addition, supported by the use of practical apparatus such as counters or cubes. e.g.

5 x 3 can be shown as five groups of three with counters, either grouped in a random pattern, as below:
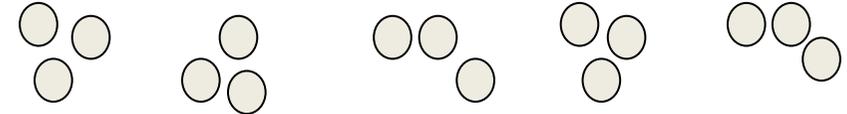
or in a more ordered pattern, with the groups of three indicated by the border outline:
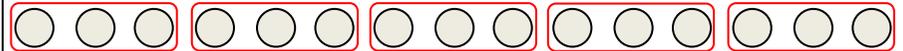
Children should then develop this knowledge to show how multiplication calculations can be represented by an array, (this knowledge will support with the development of the grid method in the future). Again, children should be encouraged to use practical apparatus and jottings to support their understanding, e.g.
5 x 3* can be represented as an array in two forms (as it has commutativity)
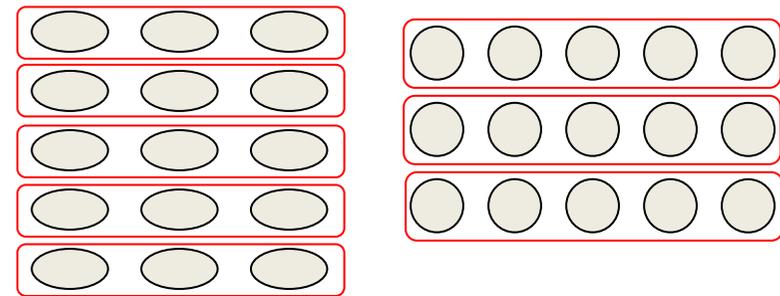
5 + 5 + 5 = 15

3 + 3 + 3 + 3 + 3 = 15

*For mathematical accuracy 5 x 3 is represented by the second example above, rather than the first as it is five, three times. However, because we use terms such as 'groups of' or 'lots of', children are more familiar with the initial notation. Once children understand the commutative order of multiplication the order is irrelevant).

Dimple Well Infant School and Nursery Calculation Methods and Strategies – Division

Mental Division

## Year 1

Counting in steps
Count in 2s, 5s, 10s e.g. colour multiples on a 0 - 100 grid. Identify patterns. Count from 0 in multiples of 10.

Doubling and Halving
Find half of even numbers to 100 using partitioning.
Use halving as a strategy in dividing by 2, e.g. 20 ÷ 2 is half of 20
In problem solving contexts, children will use practical equipment to share out objects equally and to group objects to represent division.

Children should find the answer by counting how many cards **1 person** has got.
6 football stickers are shared between 2 people, how many do they each get?
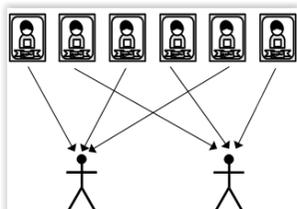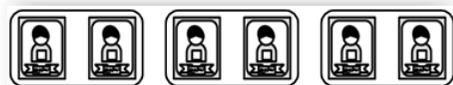
Children should find the answer by counting how many **groups of 2** there are. The teacher can model the link between sharing and grouping in the following way by relating back to the first football sticker question:
Placing the football stickers in a bag or box, the teacher can ask the children how many stickers would need to be taken out of the box to give each person one sticker each (i.e. 2) and exemplify this by putting the cards in groups of 2 until all cards have been removed from the bag.

Children may solve this by using a 'one for you, one for me' strategy until all of the cards have been given out.

Year 2

Counting in steps
Count in 2s, 3s, 5s, 10s e.g. colour multiples on a 0 -100 grid. Identify patterns. Count from 0 in multiples of 10, 100.
Count in 2s, 5s and 10s
Begin to count in 3s
Using NUMICON, say where a given number is in the 2s, 5s or 10s count. (E.g. 8 is the fourth number when I count in twos.)
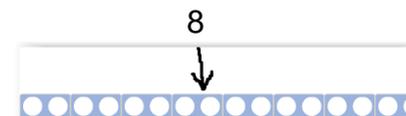Relate division to grouping. (E.g. how many groups of five in fifteen?)
Numicon
Halve numbers to 20
Begin to halve numbers to 40 and multiples of 10 to 100
Find ½, 2/4, ¼ and ¾ of a quantity of objects and of amounts (whole number answers)

8

Written Division	Recording through photographs of 'shared' objects. No formal written method although teacher models sharing and grouping. Children will utilise practical equipment to represent division calculations as grouping (repeated subtraction / 'Lots of ') and use jottings to support their calculation, e.g.12 ÷ 3 = 〇〇〇 〇〇〇 〇〇〇 〇〇〇	Children should also move onto calculations. e.g.20 ÷ 4 = 5 〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇〇