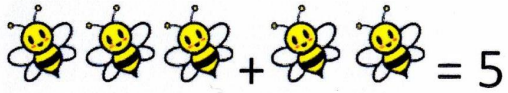
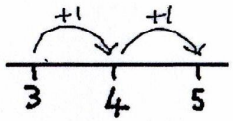
Addition

Stage 1

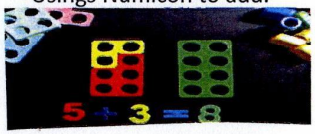
- Children understand the concept of addition as the combining of 2 or more groups.
- They count using objects starting at the largest number



- They use the + and = symbols correctly, understanding that: 2 + 3 = 5 and 5 = 2 + 3
- Extend to counting up in ones on a number line:



Usings Numicon to add.

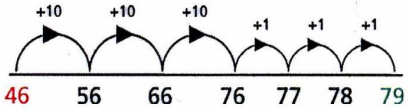


- They begin to count using **dienes equipment** (ones and tens)

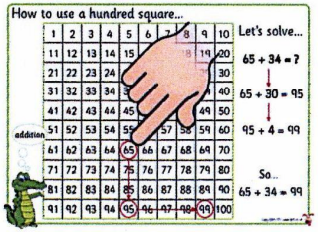
Stage 2

- Children add 2 digit numbers by counting on in tens then ones on a number line:

46 + 33
= 46 + 10 + 10 + 10 + 1 + 1 + 1
= 79



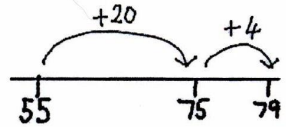
- Children use a **100 square** to begin to add two digit numbers by counting on in tens then ones



Stage 3

- Children use an empty number line to extend partitioning adding the tens then the ones

55 + 24
= 55 + 20 + 4
= 79



Children must have a good understanding of place value and partitioning

Recommended by the end of year 2

Stage 4

- Children should now use column addition of 2, 3 and 4 digit numbers using this expanded method: (No carrying)
- Place value counters can be used to model this

643 + 225 = leading to **643 + 225**

643
+ 225
8
+ 60
800
868

643
+ 225
868

Recommended by the end of year 3

Stage 5

- This leads to the short written method of addition in columns using 'carrying'

789
+ 642
1431

Recommended by the end of year 4

Stage 6

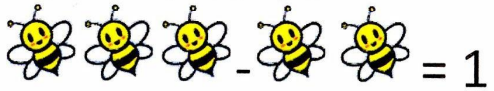
- The same method is applied to addition of decimals

56·85
+ 36·85
93·70

Subtraction

Stage 1

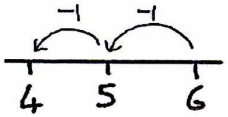
- Children understand the concept of subtraction as the taking a number away from another.
- They take away using objects



- They use the - and = symbols correctly, understanding that:

$6 - 2 = 4$ and $4 = 6 - 2$

- Extend to counting backwards in ones on a number line:

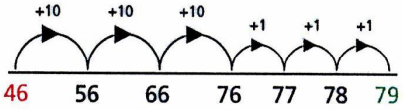


- They visualise differences using **multilink**/Numicon

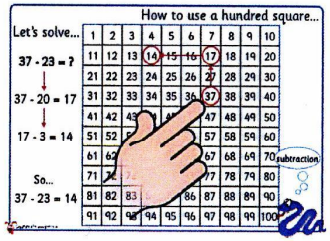
Stage 2

- Children begin to find 'the difference '

$79 - 46 = 33$



- Children use a **100 square** to subtract a two digit number by counting back in tens then ones



Stage 3

- Continue to encourage use of number line to find the difference by counting from smaller number to the larger one
- Progress to vertical subtraction without decomposition.
- Dienes equipment can be used to model this

Start here

$$\begin{array}{r} 156 \\ -\ 33 \\ \hline 123 \end{array}$$

Recommended by the end of year 3

Stage 4

- Children should now learn vertical subtraction with decomposition
- Dienes equipment can be used to model the method of exchanging

Start here

$$\begin{array}{r} {}^{8}\not{9}\,{}^{1}\not{3}\,{}^{1}2 \\ -\ 457 \\ \hline 475 \end{array}$$

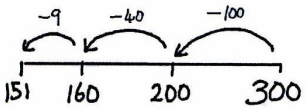
Recommended by the end of year 4

Stage 5

- Subtracting from numbers containing zeroes such as 300 can be done by subtraction with decomposition but children may find using a number line more straight forward. See both methods below:

Start here

$$\begin{array}{r} {}^{2}3\,{}^{1}0\,{}^{1}0 \\ -\ 149 \\ \hline 151 \end{array}$$



Stage 6

- The same method is applied to subtraction of decimals

Start here

$$\begin{array}{r} {}^{5}2\,{}^{1}\not{6}\,{}^{1}3\cdot 5 \\ -\ 59\cdot 8 \\ \hline 203\cdot 7 \end{array}$$

Multiplication

Stage 1

- Children begin to understand the concept of multiplication as grouping and 'lots of' and recognise the X symbol

- They group objects and begin to understand

3 lots of 2 3 x 2 = 6

- They use X and = symbols and understand that

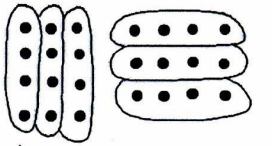
3 x 2 = 6 6 = 3 x 2

2 x 3 = 6 6 = 2 x 3

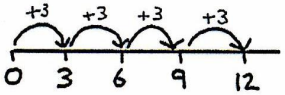
- Numicon to visualise.

Stage 2

- Children describe multiplication as an array and understand that it can be worked out in any order:



4 x 3 = 12 3 x 4 = 12



- They use repeated addition on a number line

Recommended by the end of year 2

Stage 3

- Children partition a number in order to multipy each part by a single digit:

54 x 6

4 x 6 = 24 24

50 x 6 = 300 + 300

324

Children must be mastering their knowledge and use of 2x 3x 4x 5x 8x 10x table facts

Recommended by the end of year 3

Stage 4

- Children should know all tables to 12x12
- Children use a formal written method of short multiplication

354 x 6 which condenses to:

354
x 6
24
300
+ 1800
2124

354
x 6
3 2
2124

Recommended by the end of year 4

Stage 5

- Children progress to using formal long multiplication to multiply by a 2 digit number

124 x 26

124
x 26
744
+ 2480
3224

Recommended by the end of year 5

Stage 6

- Children practice and master written methods continuing to decimals:

73.15
x 4
1 2
292.60

Division

Stage 1

- Children begin to understand the concept of division as sharing and grouping and recognise the ÷ symbol

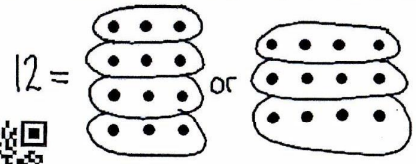
- They group objects and begin to understand

6 shared equally by 3 = 2 6 ÷ 3 = 2

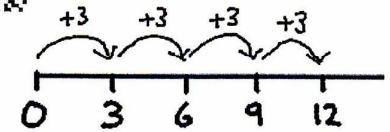
- They use the ÷ and = symbols

Stage 2

- Children use arrays to group or divide numbers



12 ÷ 3 = 4 12 ÷ 4 = 3

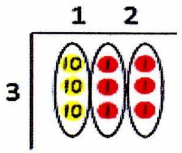


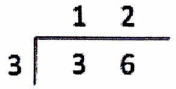
- They use repeated addition on a number line to reach the number

Recommended by the end of year 2

Stage 3

- Children use short division to divide numbers
- Place Value counters can be used to model this method initially



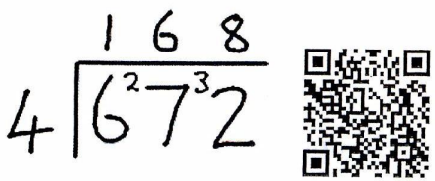


Recommended by the end of year 3

Stage 4

- Children use a formal written method of short division to divide 3 digit numbers by 1 digit

672 ÷ 4



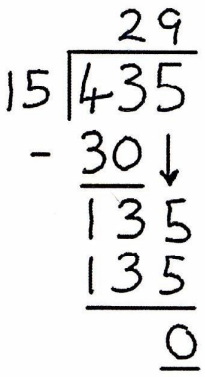
- They then move on to finding remainders

Recommended by the end of year 4

Stage 5

- Children progress to using formal long division to divide by a 2 digit number

435 ÷ 15



Video

Stage 6

- Children practice and master written methods continuing to decimals:

365 ÷ 4