St Augustine of Canterbury RC Primary School

Maths - Mental Calculations Policy

In the name of God the Father, the Son and the Holy Spirit, we remember that each person is gifted, unique and loved by God and so in the family of St Augustine's we:

Welcome everyone in Jesus' name;
Work together in Jesus' community;
Follow Jesus' example in all we do;
Learn with Jesus as our inspiration;
Grow in faith with Jesus as our leading light.

Y1

End of Year Objective:
Add and subtract one-digit and two-digit numbers to 20, including zero.

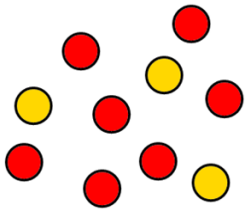
Rapid Recall

Children should be able to:

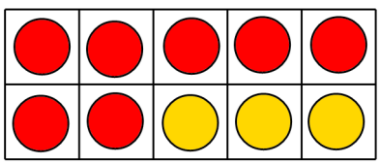
- represent and use number bonds and related subtraction facts within 20

Number bonds can be represented practically using:

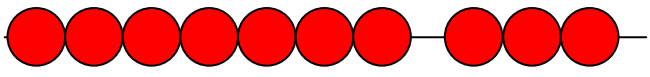
Double sided counters:



Ten frames:



Beadstrings



Mental Strategies

Count on or back in ones (chain count and linked to objects, i.e. 1-1 correspondence)

Initially, children's counting for addition and subtraction should be linked to the objects that they are using to represent the calculation, e.g. cubes, counters etc. It is important that at this stage the counting and calculating are supported by practical equipment and/or be in context so that they support children's developing understanding of the concepts of addition and subtraction in a concrete rather than abstract way.

Children can begin to use chain counting (i.e. unsupported by objects) when they are confident with the concepts of addition and subtraction and have developed their understanding of using counting on or back, rather than counting all, as a strategy for these calculations.

Examples of calculations:

4 + 5	count on in ones from 4 (or in ones from 5)
8 – 3	count back in ones from 8
10 + 7	count on in ones from 10 (or use place value)
13 + 5	count on in ones from 13
17 – 3	count back in ones from 17

Prerequisite skills:

- Count using one to one correspondence
- Count forwards and backwards in ones

To develop an understanding of addition and subtraction, the progression through learning should be:

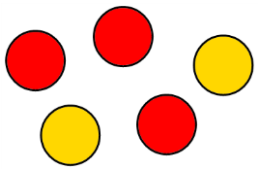
Concrete ⟶ Model ⟶ Abstract

An example of this might be:

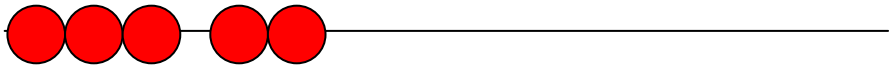
Using counters ⟶ Using a beadstring ⟶ Placing cubes on a number track ⟶ Using a numberline
(Concrete – random) (Concrete – organised) (Model) (Abstract)

Addition

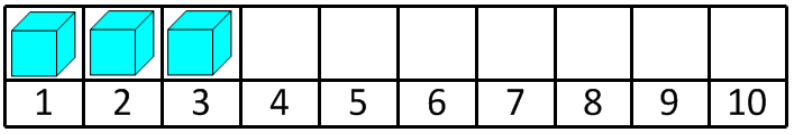
3 + 2 = 5



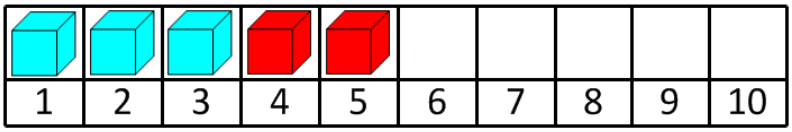
Counters



Beadstring

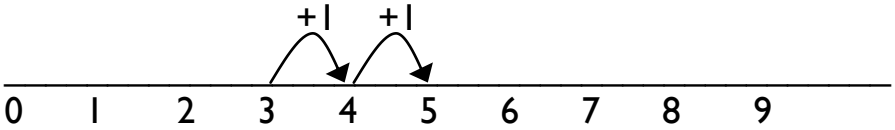


Number track stage 1



Number track stage 2

3 + 2 = 5



Numberline

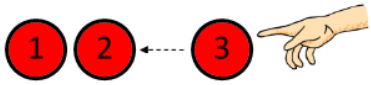
Subtraction

5 – 2 = 3

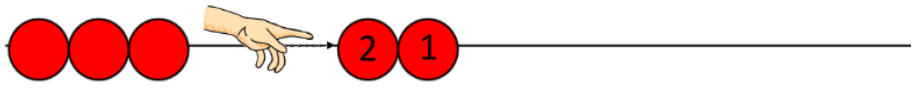
Touch count and remove the number to be taken away, in this case 2.

Counters stage 1

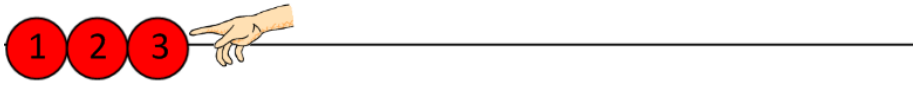
Touch count to find the number that remains.



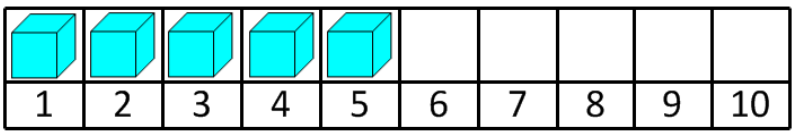
Counters stage 2



Beadstring stage 1



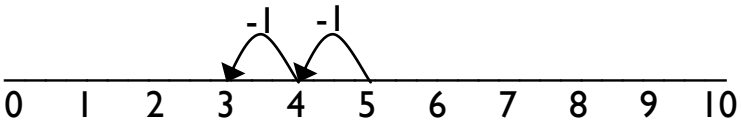
Beadstring stage 2



Number track stage 1

Number track stage 2

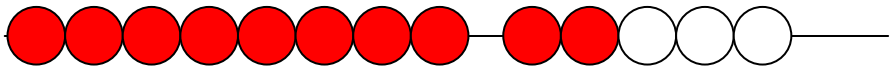
5 – 2 = 3



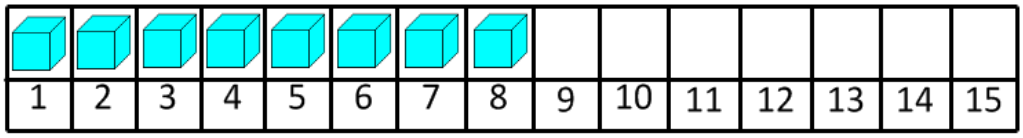
Numberline

Addition

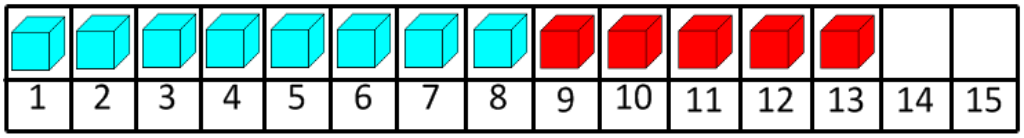
8 + 5 = 13



Beadstring

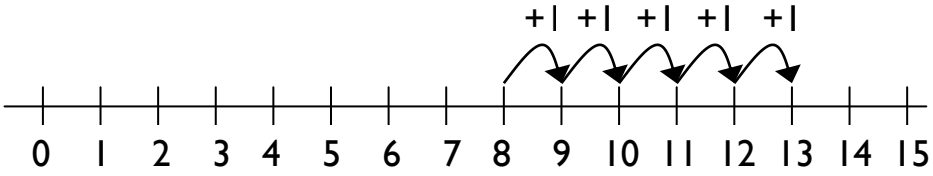


Number track stage 1



Number track stage 2

8 + 5 = 13

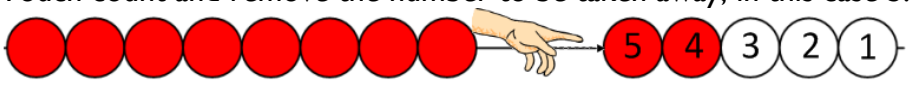


Numberline

Subtraction

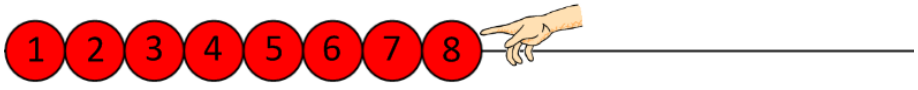
13 – 5 = 8

Touch count and remove the number to be taken away, in this case 5.

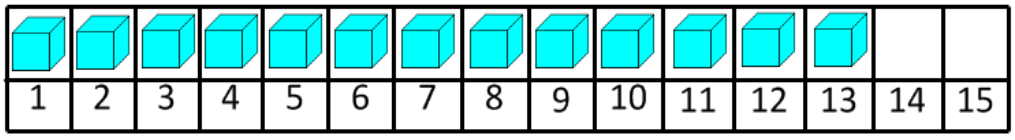


Beadstring stage 1

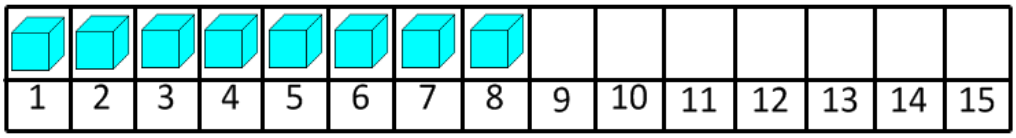
Touch count to find the number that remains.



Beadstring stage 2

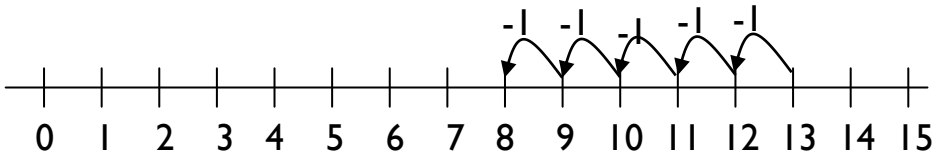


Number track stage 1



Numbertrack stage 2

13 – 5 = 8



Numberline

Reorder numbers in a calculation

In Y1, children need to recognise that they can rearrange an addition, but not a subtraction. They also need to understand that the principle behind reordering a calculation is to make it more efficient, particularly when utilising a counting on strategy. Children need to be encouraged to identify calculations which should be reordered and those that are already in the most efficient format.

Examples of calculations:

8 + 3	doesn't need reordering as the greater number is first already
2 + 7	reorder as 7 + 2
5 + 13	reorder as 13 + 5
11 + 6	doesn't need reordering as the greater number is first already

Prerequisite skills:

- Understand the place value of numbers to identify which number is the greater
- Understand that reordering works (at this stage) for addition but not subtraction* *(because children are not at the level when they are solving calculations such as 16 – 3 – 6, when reordering would be appropriate).*

Partition small numbers, e.g. 8 + 3 = 8 + 2 + 1

Utilising partitioning in this way is useful as a strategy for bridging across 10 or multiples of 10 to make calculations more efficient.

Examples of calculations:

7 + 5	partitioned as 7 + 3 + 2
9 + 7	partitioned as 9 + 1 + 6
6 + 8	partitioned as 6 + 4 + 4

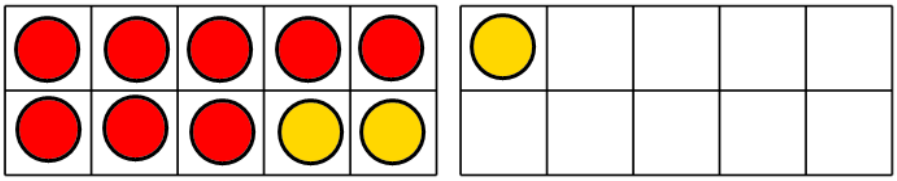
Prerequisite skills:

- Partition numbers in different ways, e.g. 5 as 2 + 3 to enable 8 + 5 as 8 + 2 + 3
- Know, or quickly derive, number bonds for numbers up to and including 10

This method can be supported by the use of practical equipment, e.g.

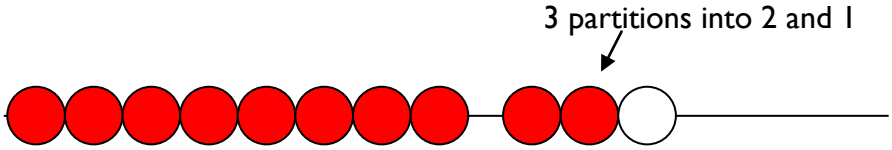
Addition

8 + 3 = 11



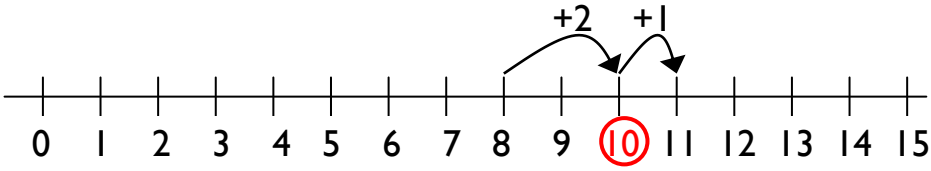
Ten frame

8 + 3 = 11



Beadstring

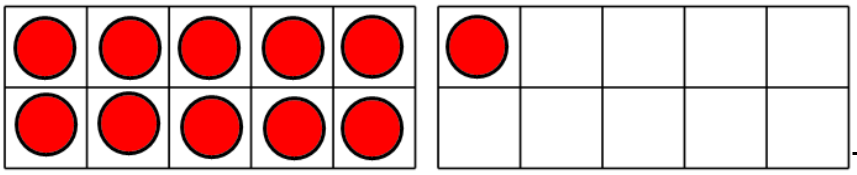
8 + 3 = 11



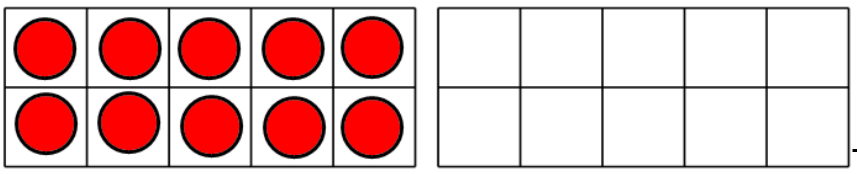
Numberline

Subtraction

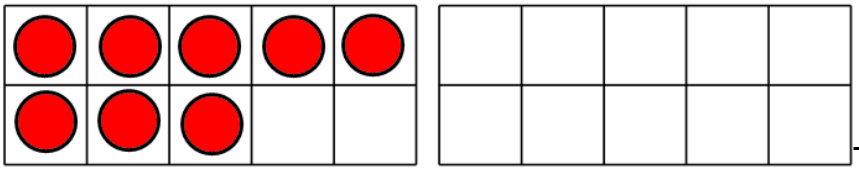
11 – 3 = 8



Ten frame stage 1

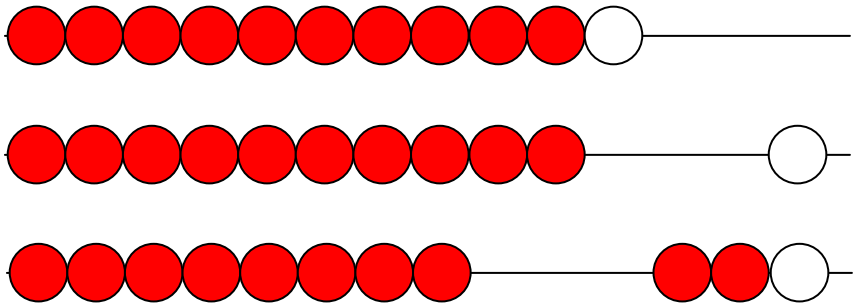


Ten frame stage 2 (take away 1)



Ten frame stage 3 (take away 2)

11 – 3 = 8



Beadstring stage 1

Beadstring stage 2 (take away 1)

Beadstring stage 3 (take away 2)

11 – 3 = 8