



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.

Y3

End of Year Objective:

Add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three-digit number and hundreds.

Rapid Recall

Children should be able to:

- recall and use addition and subtraction facts for 100 (multiples of 5 and 10)
- derive and use addition and subtraction facts for 100
- derive and use addition and subtraction facts for multiples of 100 that total 1000

Mental Strategies

Partition and combine multiples of hundreds, tens and ones

Partitioning numbers is a core strategy for adding and subtracting pairs of numbers. Children can either partition both of the numbers in the calculation, or keep the first number the same and just partition the second. (See Y2 for more information).

Examples of calculations:

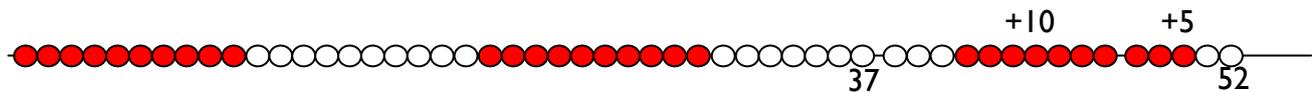
526 + 200	counting on in hundreds
137 + 40	counting on in tens
272 + 8	counting on in ones
428 - 200	counting back in hundreds
323 - 70	counting back in tens
693 - 8	counting back in ones
37 + 15	37 add 10 and 5 = 37 add 10 add 5 (crossing tens boundaries)
42 - 25	42 take away 20 and 5 = 42 take away 20 take away 5 (crossing tens boundaries)

Prerequisite skills:

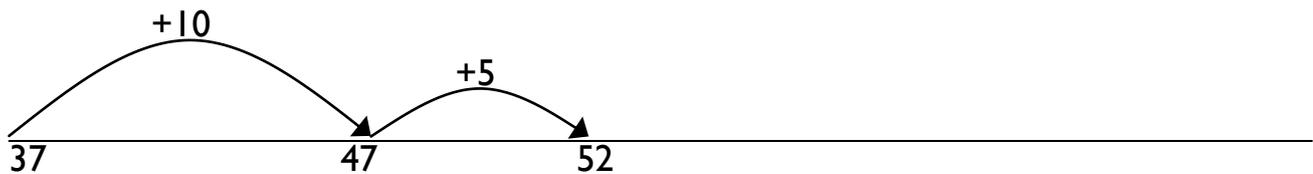
- Count forwards and backwards in ones, tens and hundreds from any one-, two- or three-digit number
- Understand place value and understand which digit changes if one, ten or hundred is added or subtracted
- Partition numbers into hundreds, tens and ones

Addition

$37 + 15 = 52$ (shown using a beadstring)



$37 + 15 = 52$ (shown using a numberline)

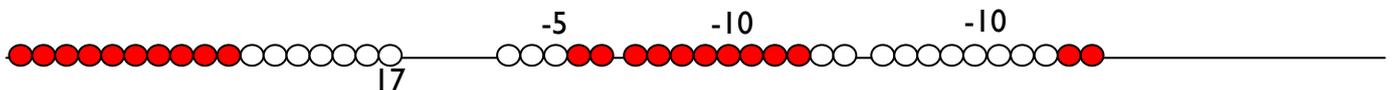


$37 + 15 =$ (shown using number sentences)

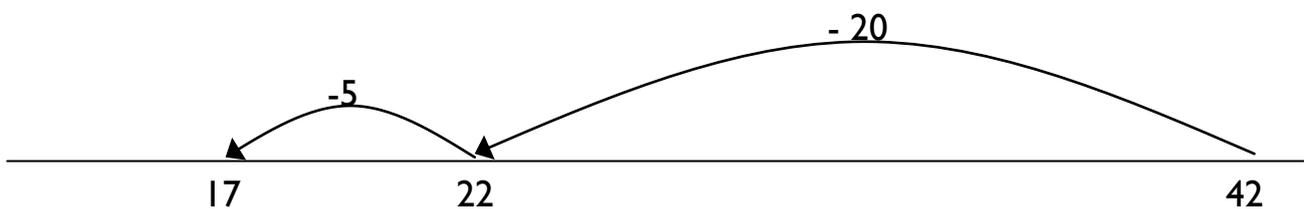
$$37 + 10 = 47$$
$$47 + 5 = 52$$

Subtraction

$42 - 25 = 17$ (shown using a beadstring)



$42 - 25 = 17$ (shown using a numberline)



$$42 - 25 = 17 \text{ (shown using number sentences)}$$

$$42 - 20 = 22$$

$$22 - 5 = 17$$

Reorder numbers in a calculation

In Y3, children need to build on their knowledge gained in Y2 and continue to reorder calculations to make them more efficient. (See Y2 for more information).

Examples of calculations:

$$23 + 54$$

$$54 + 23$$

$$12 + 19 + 12$$

$$12 + 12 + 19 \text{ (using knowledge of doubles)}$$

$$6 + 8 + 4$$

$$6 + 4 + 8 \text{ (using knowledge of number bonds to 10)}$$

$$70 + 50 + 30$$

$$70 + 30 + 50 \text{ (using knowledge of number bonds to 100)}$$

Prerequisite skills:

- Understand the place value of numbers to identify which number is the greater
- Understand that reordering works 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).

Identify and use knowledge of number bonds within a calculation

Number bonds to 10 and 100 can be used to make calculations more efficient when combined with other strategies such as reordering and partitioning.

Examples of calculations:

$$42 + 38$$

$$42 + 30 + 8 \text{ (recognising that 2 and 8 is a number bond to 10, so the answer will be a multiple of 10)}$$

$$60 - 28$$

$$60 - 20 - 8 \text{ (utilising knowledge that } 10 - 8 = 2, \text{ so } 40 - 8 = 32)}$$

$$120 - 50$$

$$120 - 20 - 30 \text{ (utilising knowledge of number bonds to 100, leaving an answer of 70)}$$

Prerequisite skills:

- Know, or quickly derive, number bonds to 10 and 100
- Identify number bonds within other numbers, e.g. identifying $7 + 3$ within the calculation $57 + 33$
- Identify that when adding two two-digit numbers, that $57 + 43 = 100$ but $57 + 53$ does not and why

Find differences by counting up through the next multiple of 10 or 100

In Y3, children need to build on their knowledge and understanding gained in Y2 to find larger differences that cross 10 and 100 boundaries. Some of these calculations are preparing children for time and money calculations throughout KS2.

Examples of calculations:

$$60 - 43$$

useful for time calculations, e.g. a journey time from 2:43 until 3:00

53 – 38
104 – 95
200 – 86

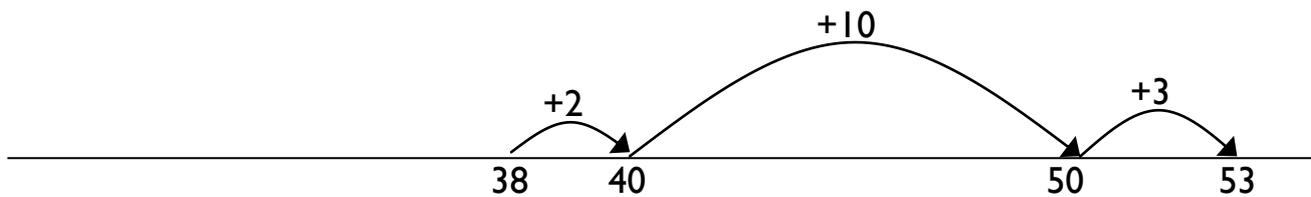
efficient because the numbers are close to each other
efficient because the numbers are close to each other
useful for money calculations, e.g. change from £2 when spending 86p

Prerequisite skills:

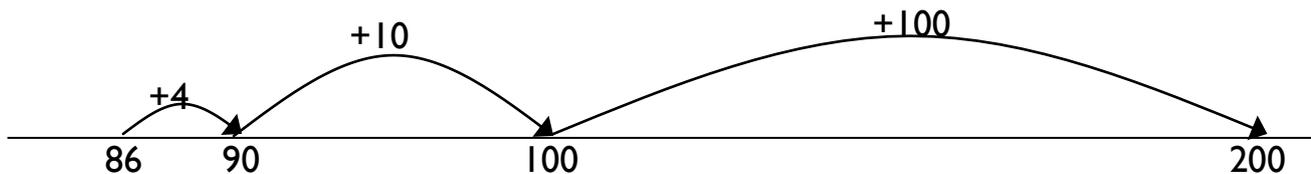
- Understand the place value of numbers to identify which number is the greater or lesser
- Establish whether numbers are close together or near to multiples of 10 or 100
- Place numbers appropriately on an unmarked numberline
- Count forwards and backwards in ones and tens

Children could use empty numberlines to record the calculation.

$$53 - 38 = 15$$



$$200 - 86 = 114$$



Bridge through 10 when adding or subtracting a single digit number (partitioning, e.g. $58 + 5 = 58 + 2 + 3$ or $76 - 8 = 76 - 6 - 2$)

In Y3, children need to consolidate their knowledge and understanding gained in Y2. (See Y2 for more information).

Examples of calculations

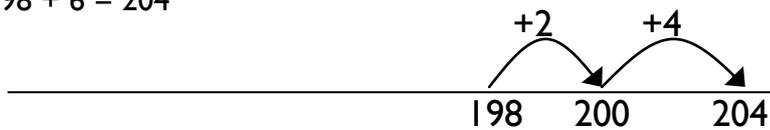
35 + 7 as 35 + 5 + 2
97 + 6 as 97 + 3 + 3
178 + 5 as 178 + 2 + 3
42 – 7 as 42 – 2 – 5
204 – 6 as 204 – 4 – 2
371 – 5 as 371 – 1 – 4

Prerequisite skills:

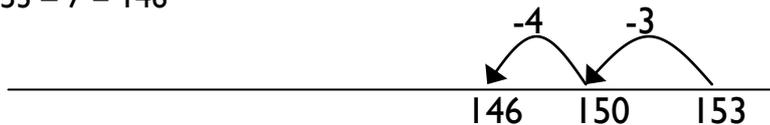
- Partition numbers in different ways, e.g. 5 as 2 + 3 to enable $58 + 5$ as $58 + 2 + 3$
- Know, or quickly derive, number bonds to 10

Children could use empty numberlines to record the calculation.

$$198 + 6 = 204$$



$$153 - 7 = 146$$



The bridging strategy can then be linked with the partitioning strategy for efficient addition and subtraction of two two-digit numbers.

Add or subtract 9, 19, 29 etc by rounding and compensating

In Y3, children need to build on their knowledge and understanding gained in Y2 (See Y2 for more information) to add and subtract one less than a multiple of 10 up to 89 to two and three-digit numbers.

Examples of calculations

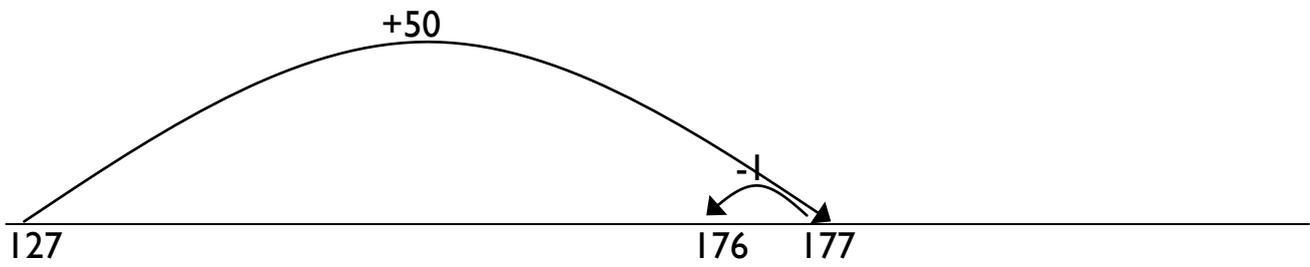
$34 + 29$	as $34 + 30 - 1$
$127 + 49$	as $127 + 50 - 1$
$96 - 39$	as $96 - 40 + 1$
$273 - 59$	as $273 - 60 + 1$

Prerequisite skills:

- Identify the difference between the number being added and subtracted and the multiple of 10
- Understand that the adjustment needs to be the opposite of the operation carried out

$$127 + 49 = 176 \text{ (shown using a numberline)}$$

We've added fifty which is one too many, so we need to take one away.

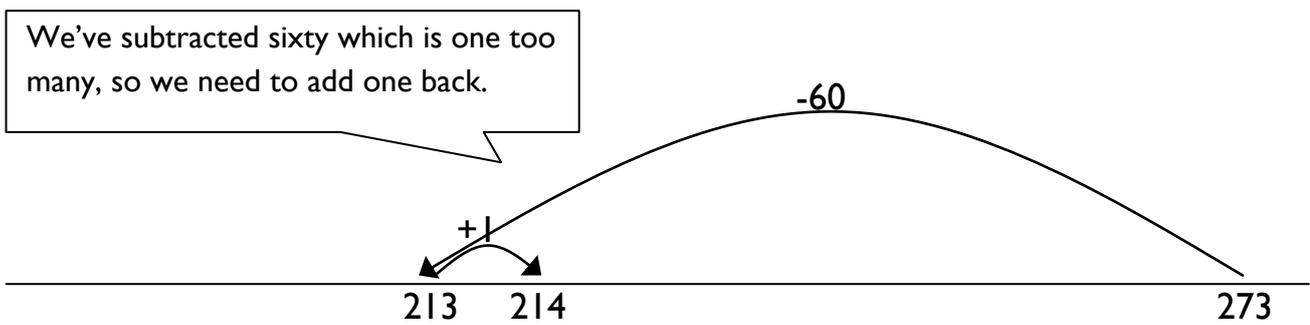


$127 + 49 = 176$ (shown using number sentences)

$$127 + 50 = 177$$

$$177 - 1 = 176$$

$273 - 59 = 214$ (shown using a numberline)



$273 - 59 = 214$ (shown using number sentences)

$$273 - 60 = 213$$

$$213 + 1 = 214$$