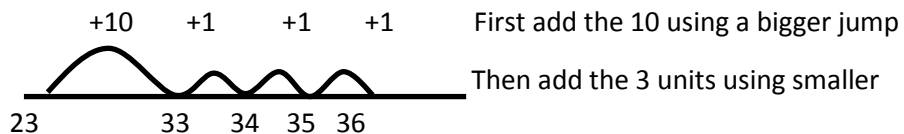


Addition

Number lines

An empty number line is just a line drawn by the child, without numbers marked on it. The child then writes on only the numbers needed to help with the calculation. Children may need to be able to partition numbers in ways other than into tens and ones to help them make multiples of ten by adding in steps. E.g. $23 + 13$



Partitioning

Partitioning is another word for separating the digits.

This is a method for carrying out mental calculations by separating out the tens and units. Partition both numbers and recombine.

$$36 + 53 =$$

$$6 + 3 = 9$$

$$50 + 30 = 80$$

$$80 + 9 = 89$$

NB: When extending to hundreds, it is vital that the children understand the importance of zeroes as place holders E.g. $102 = 1$ hundred, **0 tens** and 2 units.

Compensation Method

Children who are confident with rounding may use the compensation method. This means they add on more than is needed, then adjust to fit the calculation.

$$\text{E.g. } 40 + 19 = ?$$

Round the 19 up to the nearest 10 first:

$$40 + 20 = 60$$

Then adjust by taking away the extra 1:

$$60 - 1 = 59$$

Adding 11 or 9.

Add 10 then adjust by either taking one away or adding 1

$$23 + 11 =$$

$$23 + 10 = 33 \text{ then add } 1$$

Maths

~Partition two-digit numbers into different combinations of tens and ones.

~Add 2 two-digit numbers within 100 (e.g. $48 + 35$)

~Use estimation to check that their answers to a calculation are reasonable (e.g. knowing that $48 + 35$ will be less than 100).

~Subtract mentally a two-digit number from another two-digit number when there is no regrouping required (e.g. $74 - 33$).

~Recognise the inverse relationships between addition and subtraction and use this to check calculations and work out missing number problems (e.g. $\Delta - 14 = 28$).

~Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables to solve simple problems, demonstrating an understanding of commutativity as necessary (e.g. knowing they can make 7 groups of 5 from 35 blocks and writing $35 \div 5 = 7$; sharing 40 cherries between 10 people and writing $40 \div 10 = 4$; stating the total value of six 5p coins).

~Use different coins to make the same amount (e.g. pupil uses coins to make 50p in different ways; pupil can work out how many £2 coins are needed to exchange for a £20 note).

~ Read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given (e.g. pupil reads the temperature on a thermometer or measures capacities using a measuring jug).

~Read the time on the clock to the nearest 15 minutes Describe properties of 2-D and 3-D shapes

Strategies to use:

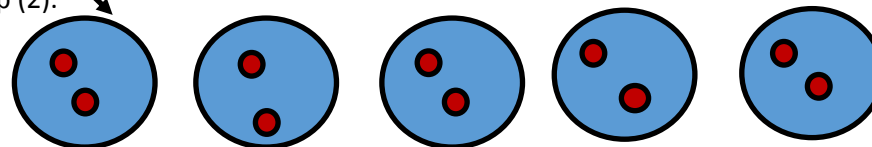
Division

In year 2 children will investigate division as both grouping and sharing. Experiences will still include lots of practical activities and then will progress to children using pictures to aid them with their mental calculations.

Division as Grouping

$$10 \div 5 =$$

Draw 5 circles then share ten between them. Finally count how many are in each group (2).



Subtraction

Place value is taught mentally first from Key Stage 1, progressing to number lines to aid calculations. In all cases make sure that the children always look out for sums that can still be done entirely mentally e.g. $21 - 9$, $15 - 5$ (number bonds to 20).

Partitioning

$$45 - 12 =$$

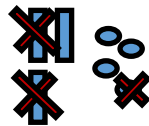
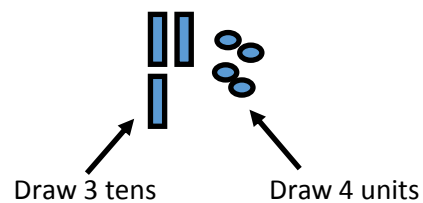
$$40 - 10 = 30$$

$$5 - 2 = 3$$

$$30 + 3 = 33$$

Informal Methods (Chips and Peas)

$$34 - 21 =$$



Now to take away 21 cross two tens out and cross 1 unit out

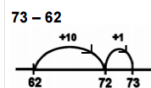
Finally count how many tens are left and how many units 1 ten and 3 units = 13

The Number line

They will start at the end of the number line and jump backwards. The larger number is written at the end of the number line and the smaller number is taken away by counting back. (jumps under the line) Again, this calculation method requires children to be able to **partition** 2 digit numbers.

The other way of using a number line is by finding the difference and counting on.

Subtraction as finding the difference (for numbers which are close together)

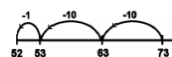


$$73 - 62 = 11$$

Start at 62. Jump 10 to 72 then 1 unit to 73.
Total jumps = $10 + 1 = 11$

Subtract the tens $70 - 20 = 50$
then the units $3 - 1 = 2$

Number line $73 - 21$



$$73 - 21 = 52$$

Start at 73 - Jump back in 'tens' twice. Then jump back in 'ones' once.

Multiplication

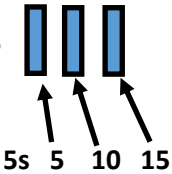
It is essential that all children learn their times tables facts. They are used in many areas of maths and need to be learnt by heart. Children need to understand that multiplication is based on repeated addition. Once this is understood, various methods of helping them to multiply 2 numbers and derive an accurate answer are taught. Remember for simple sums 2×5 you can hold two fingers up and count in fives (twice) 6×2 hold six fingers up and count in twos (six times).

Repeated Addition

Multiplication as repeated addition
 3×5



Or draw the sum 3×5



Then count in 5s 5 10 15

Partitioning

Using partitioning with multiplication helps children solve their calculation in easier steps.

Examples: $18 \times 2 = 36$

$$10 \times 2 = 20$$

$$8 \times 2 = 16$$

Children the move on to the grid method:

x	20	3
2	40	6

$$23 \times 2 =$$

Grid Multiplication enables children to see each stage of their calculation. This method also uses partitioning but is set out in a grid. It requires children to have an understanding of multiplying by 10 and 100.

The Number line

Think of the number sentence 5×4 as 5 lots of 4.

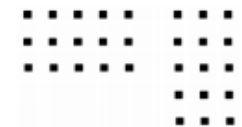
Start at zero, on the left hand end of the number line.

Make 5 jumps in 'lots of' 4.

Arrays

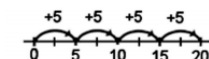
$$3 \times 5$$

$$5 \times 3$$



3 rows of 5 or
5 rows of 3

4×5
4 Jumps of 5



$$4 \times 5 = 20$$