Written Calculation Guidance

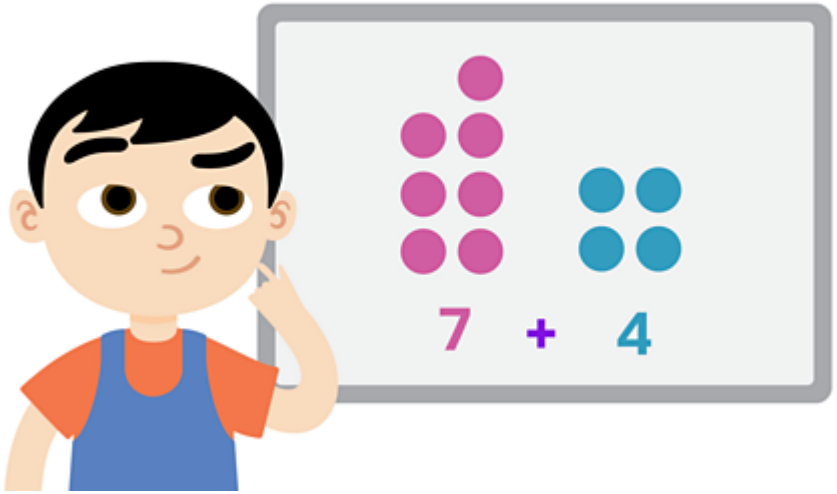
Addition

At Joseph Turner Primary School, we are always striving to raise standard sand support our children in their learning. In order to do this, we have devised this calculation guidance to ensure there is a progression of skills from mental methods to formal written methods.

As all children learn at different paces, no year groups have been assigned to each specific method as adaptations will be made to suit each learner.

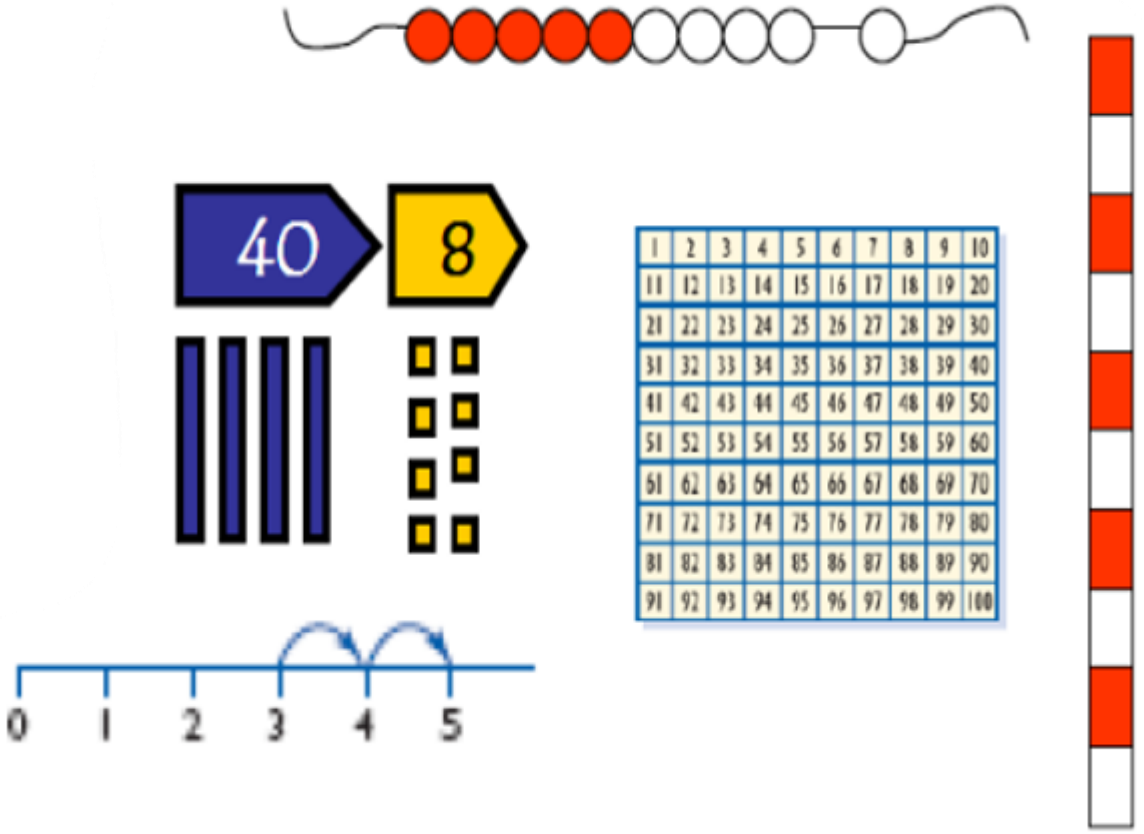
Mental Skills

- Recognise the size and position of numbers
- Count in ones and tens
- Know number bonds to 10 and 20
- Add multiples of 10 to any number
- Partition and recombine numbers
- Bridge through 10



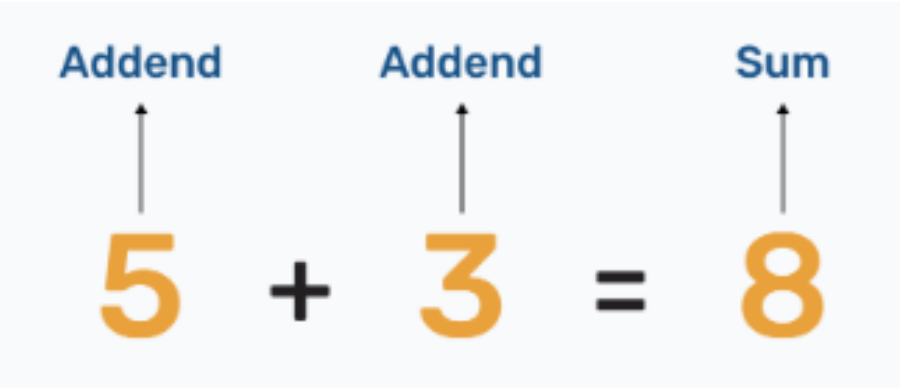
Models, Image and Apparatus

- Place value apparatus – dienes/counters/cubes
- Arrow cards
- Number tracks
- Numbered/empty number lines
- Hundred squares
- Counting stick
- Bead string
- Straws
- Rekenreks



Key Vocabulary

- Add
- Addition
- Addend
- Plus
- Sum
- Altogether
- Total
- Increase
- Double
- More than
- Put with
- Combine



Progression of methods

Recognise numbers 0 to 10

0 1 2 3 4 5 6 7 8 9 10

Count reliably up to 10 everyday objects

1,2,3,4,5,6....
There are six teddy bears

Touch and count

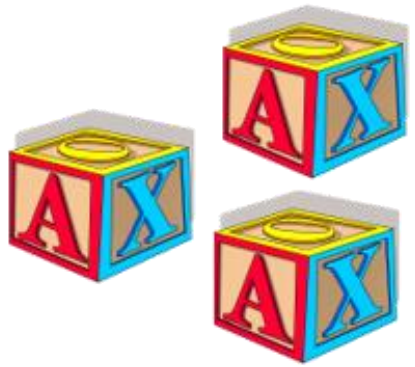
Number bonds to 5
Recognising the value of 5 without counting

→

Combinations of numbers that make 5

Must be in all different orientations and practised/applied in a number of different ways – Really important for early mathematical development

Find one more than a number



One more than 3 is 4...

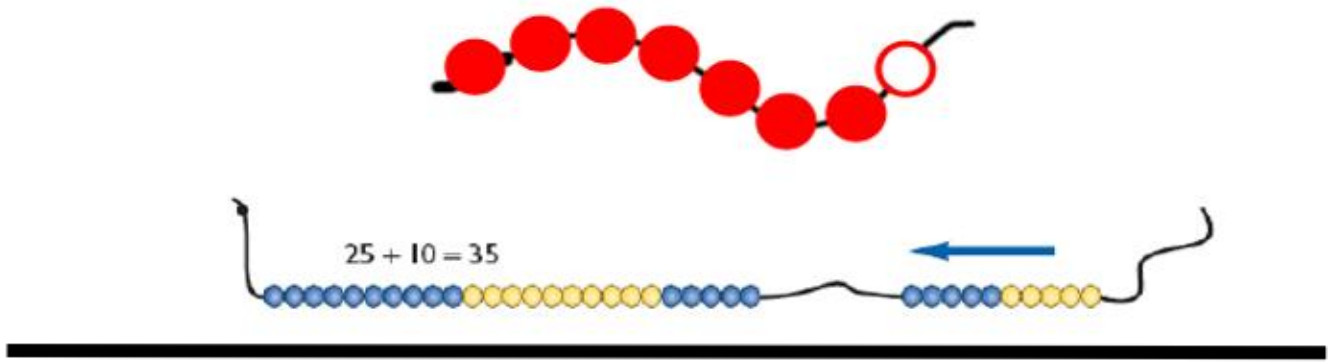
1-5 first...
then 1-10...

Begin to relate addition to combining two groups of objects

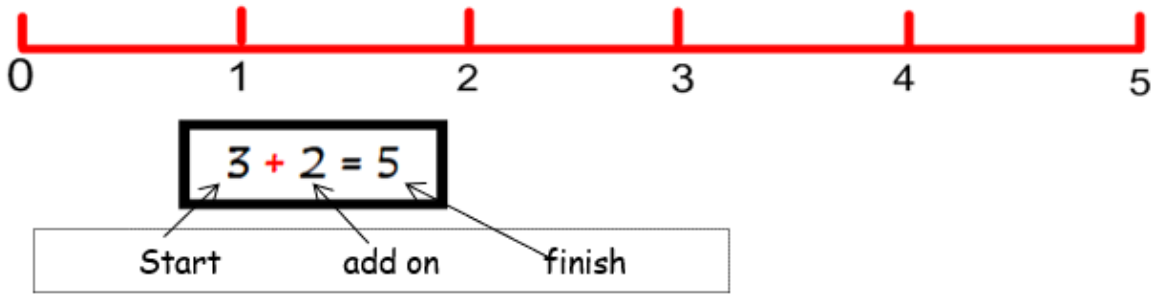
and

makes 5

Count in ones and tens



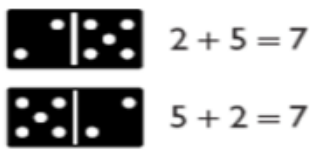
Count along a number line to add numbers together



Begin to use the + and = signs to record mental calculations in a number sentence

$6 + 4 = 10$

Know that addition can be done in any order

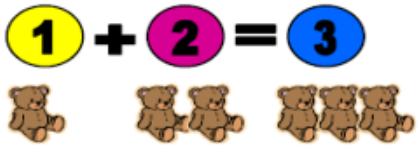


$2 + 5 = 7$

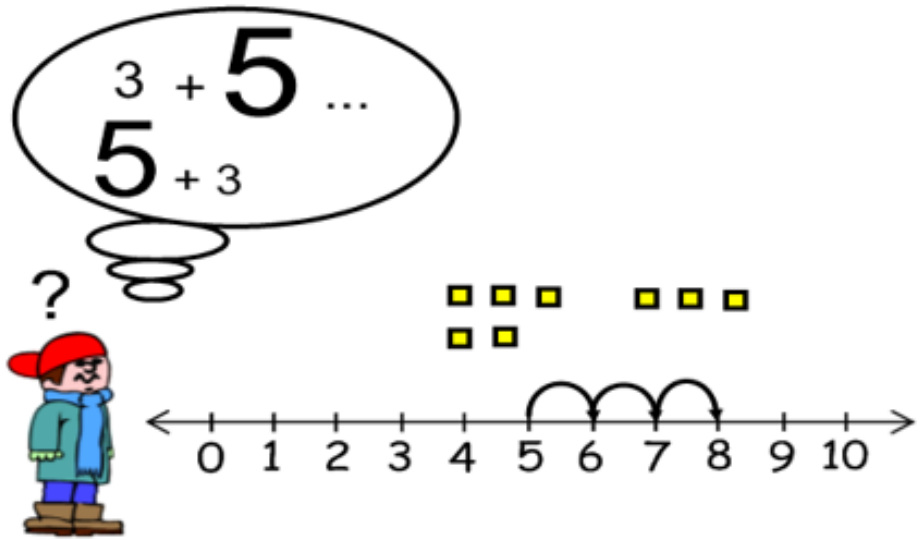
$5 + 2 = 7$

2 count on 5

5 count on 2

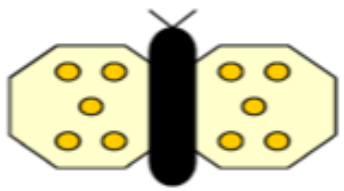


Put the biggest number first and count on



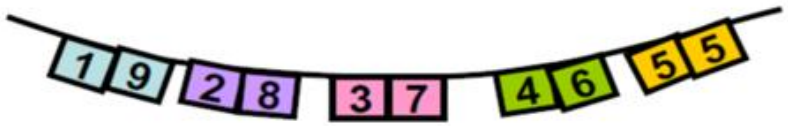
Know doubles of numbers

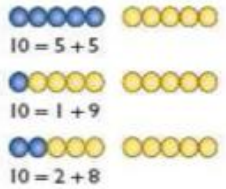
5 + 5 = 10

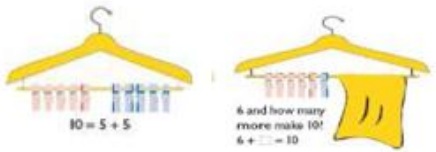


3 + 3 = 6

Know by heart all pairs of numbers with a total of 10







Using fingers

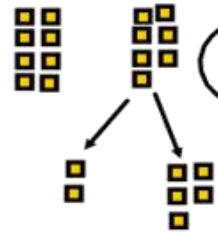
5 + ? = 10

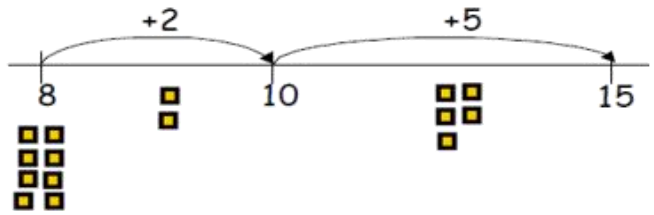
Add two single-digit numbers that bridge 10

Using Diennes

Go through the barrier of a 10

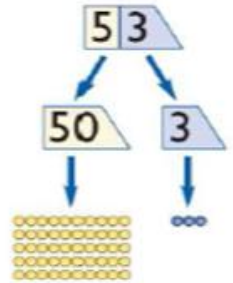
8 + 7 = 15





Separate the numbers in terms of hundreds, tens, units etc..

Begin to partition numbers in order to add

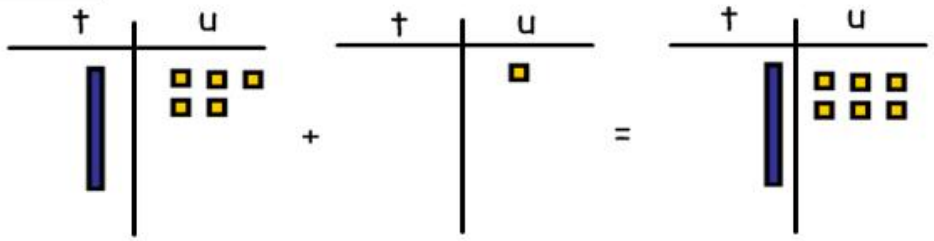


30p + 4p = 34p

Rods/counting apparatus that are used in school

Using diennes

15 + 1 = 16



Know which digit changes when adding 1s or 10s to any number

Hundreds, Tens, Units etc..

15 + 10 = 25

Adding two two-digit numbers (without bridging)

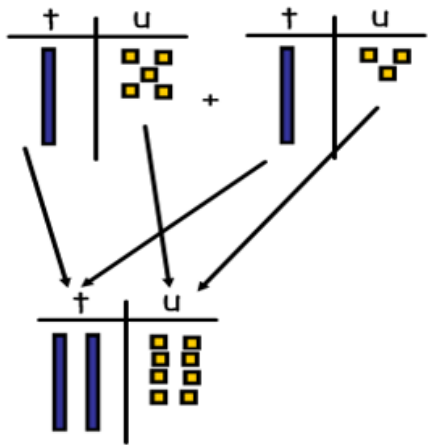
Counting in tens and ones

Partitioning and recombining

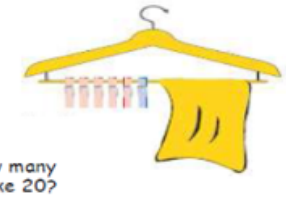
15 + 13 = 28

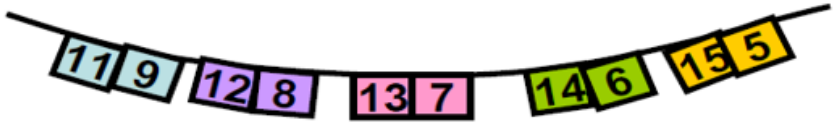
Go through the barrier of a 10

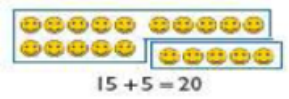
Putting back together



Know by heart all pairs of numbers with a total of 20







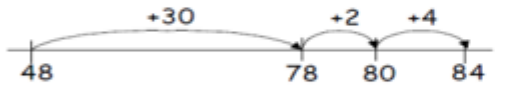
Adding two two-digit numbers
(bridging through tens boundary)

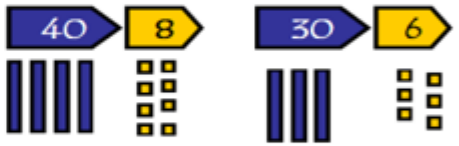
Using a number line

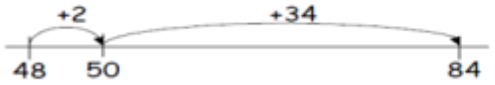
OR

Using place value cards and Dienes to partition numbers and recombine

48 + 36 = 84







40 + 30 + 8 + 6

40 + 30 = 70

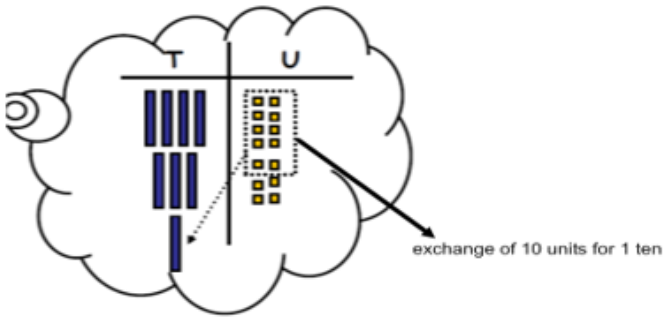
8 + 6 = 14

70 + 14 = 84

Expanded method

It is important that the children have a good understanding of place value and partitioning using concrete resources and visual images to support calculations. The expanded method enables children to see what happens to numbers in the standard written method.

48 + 36



T	U
40	+ 8
30	+ 6
80	+ 4
10	

To add mentally HTU, starting with the most significant digit first

mental partitioning →

528 + 288
500 + 200 = 700
20 + 80 = 100
8 + 8 = 16
= **816**

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528 + 288

700 + 100 +16 = 816

Partition, add and then recombine

Column addition TU + TU, no carry

$$32 + 64 = 96$$

$$\begin{array}{r} 32 \\ 64 + \\ \hline 96 \end{array}$$

Column addition TU+ TU, with carry

$$\begin{array}{r} 38 \\ +\ 26 \\ \hline 64 \\ \hline \end{array}$$

1

Repeat previous 2 steps with HTU + HTU

789 + 642 becomes

$$\begin{array}{rrrr} & 7 & 8 & 9 \\ + & 6 & 4 & 2 \\ \hline 1 & 4 & 3 & 1 \\ \hline & 1 & 1 & \end{array}$$

Answer: 1431

Repeat column addition steps 1 and 2 with decimals