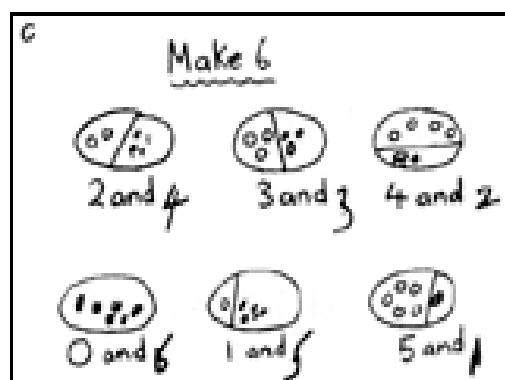


PROGRESSION THROUGH CALCULATIONS FOR ADDITION

- These standards are age-related expectations and therefore we expect the majority of children to achieve them.
- New learning is likely to be taught to groups rather than the whole class to acknowledge the different learning stages of the children.
- Children should understand that addition is commutative and therefore calculations can be rearranged, e.g. $4 + 13 = 17$ is the same as $13 + 4 = 17$.
- Ensure that children understand the = sign means is the same as and that children see calculations where the equals sign is in a different position, e.g. $3 + 2 = 5$ and $5 = 3 + 2$.
- Children should be encouraged to approximate before calculating and check whether their answer is reasonable.

YR

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They should experience practical calculation opportunities using a wide variety of equipment, e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc.



Children will see modelled recording of such calculations as $2 + 4 = 6$ or $6 = 2 + 4$.
Those who are ready may record their own calculations.

Y1

Children will continue to use practical equipment, combining groups of objects to find the total by counting. Using their developing understanding of place value, they will move on to be able to use Base 10 equipment to make teens numbers using separate tens and ones.

If possible, they can use two different colours of base 10 equipment so that the initial amounts can still be seen.

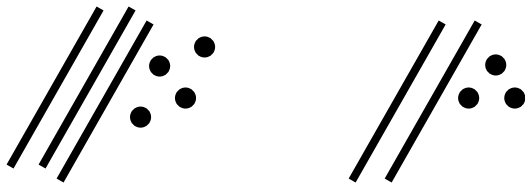
$$11 + 5 = 16$$



Y2

Children will continue to use the Base 10 equipment to support their calculations. They will record the calculations using their own drawings of the Base 10 equipment (as slanted lines for the 10 rods and dots for the ones).

e.g. $34 + 23 =$

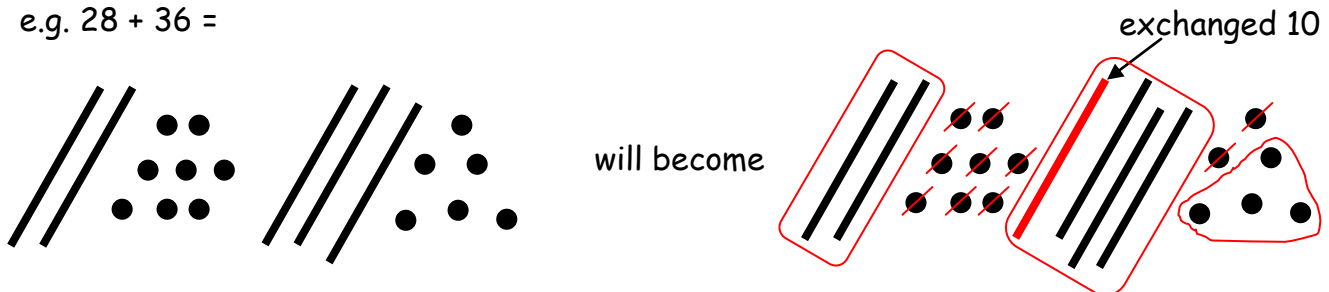


$$34 + 23 = 57$$

They would add the tens first and then count on the ones.

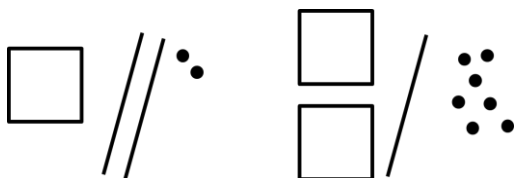
When the ones total more than 10, children should be encouraged to exchange 10 ones for 1 ten. This is the start of children understanding 'carrying' in vertical addition.

e.g. $28 + 36 =$



$$28 + 36 = 64$$

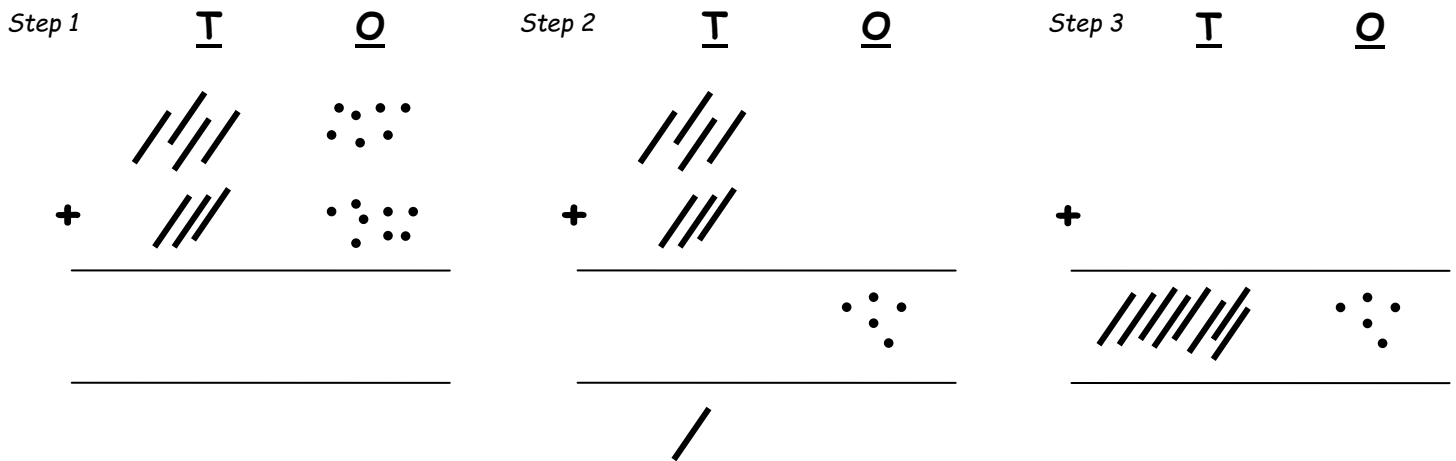
This method can also be used with three digit numbers, e.g. $122 + 217$



Y3

Children will build on their knowledge of using Base 10 equipment from Y2 and continue to use the idea of exchange. They can use a place value grid to support their knowledge of exchange between columns.

Children should add the **least significant digits** first, and in an identical method to that from Y2, should identify whether there are greater than ten ones which can be exchanged for one ten.



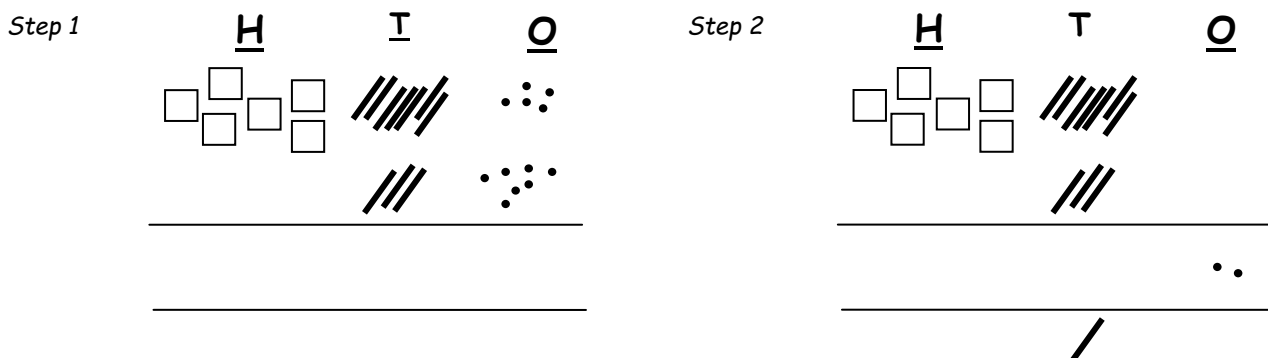
This practical method can be modelled or recorded alongside the written method.

$$\begin{array}{r}
 \text{T O} \\
 47 \\
 + 38 \\
 \hline
 85 \\
 \hline
 1
 \end{array}$$

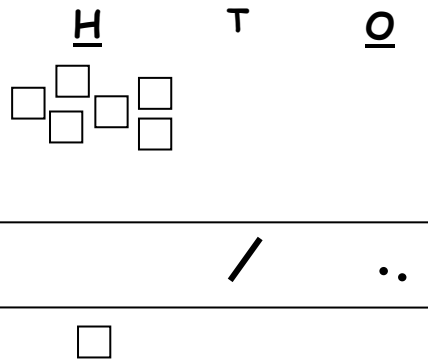
They should also extend this method for three digit numbers.

Y4

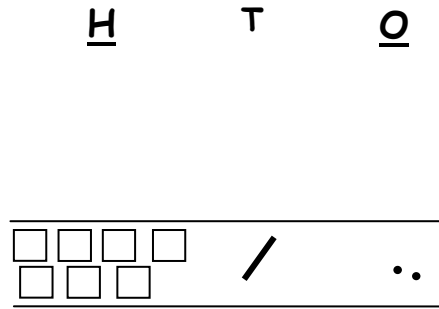
Children will move to Y4 using whichever method they were using as they transitioned from Y3.



Step 3



Step 4



Leading to:

$$\begin{array}{r}
 \text{H T O} \\
 675 \\
 + \quad 37 \\
 \hline
 712
 \end{array}$$

$$\begin{array}{r}
 783 \\
 + \quad 42 \\
 \hline
 825 \\
 1
 \end{array}$$

$$\begin{array}{r}
 367 \\
 + 285 \\
 \hline
 652 \\
 11
 \end{array}$$

$$\begin{array}{r}
 321 \\
 + \quad 7 \\
 + 48 \\
 \hline
 376 \\
 1
 \end{array}$$

$$\begin{array}{r}
 \pounds 3.48 \\
 + \pounds 0.78 \\
 \hline
 \pounds 4.26 \\
 1 \quad 1
 \end{array}$$

Using similar methods, children will:

- add several numbers with different numbers of digits;
- begin to add two or more three-digit sums of money, with or without adjustment from the pence to the pounds;
- know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. $\pounds 3.59 + 78\text{p}$.

Y5

Children should extend the carrying method to numbers with at least four digits.

$$\begin{array}{r}
 587 \\
 + 475 \\
 \hline
 1062 \\
 1 \quad 1
 \end{array}$$

$$\begin{array}{r}
 3587 \\
 + 675 \\
 \hline
 4262 \\
 1 \quad 1 \quad 1
 \end{array}$$

$$\begin{array}{r} 3121 \\ + 37 \\ + 148 \\ \hline 3306 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 3.20 \\ + 2.88 \\ \hline 6.08 \\ \hline 1 \end{array}$$

Using similar methods, children will:

- add several numbers with different numbers of digits;
- begin to add two or more decimal fractions with up to three digits and the same number of decimal places;
- know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 3.2 m + 280 cm.

Y6

Children should extend the carrying method to number with any number of digits.

$$\begin{array}{r} 7648 \\ + 1486 \\ \hline 9134 \\ \hline 111 \end{array}$$

$$\begin{array}{r} 6584 \\ + 5848 \\ \hline 12432 \\ \hline 111 \end{array}$$

$$\begin{array}{r} 42 \\ 6432 \\ 786 \\ 3 \\ + 4681 \\ \hline 11944 \\ \hline 121 \end{array}$$

$$\begin{array}{r} 401.20 \\ + 26.85 \\ + 0.71 \\ \hline 428.76 \\ \hline 1 \end{array}$$

Using similar methods, children will

- add several numbers with different numbers of digits;
- begin to add two or more decimal fractions with up to four digits and either one or two decimal places;
- know that decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. 401.2 + 26.85 + 0.71.

+ - + - + - + - + - + - +

By the end of year 6, children will have a range of calculation methods, mental and written. Selection will depend upon the numbers involved.

Children should not be made to go onto the next stage if:

- 1) they are not ready.
- 2) they are not confident.

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.