A guide to ‘Helping your child with written methods in Maths’ at home

Years 3 & 4

Children will be following the CPA approach.

C – concrete – can we MAKE it?

Children will use manipulatives (resources) to help make the calculations. This might be using cubes, counters, or any other objects that can represent numbers.

Once the children can make it, we move to

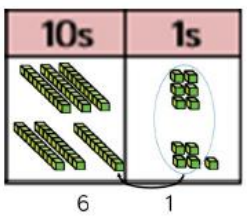
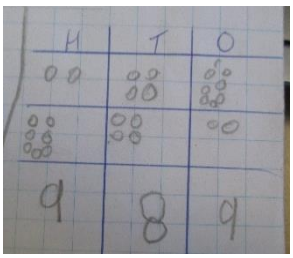
P – pictorial – can we DRAW it?

Children will need to draw their representations. Perhaps copying the objects used first, then moving to use lines and circles (sticks and stones) towards the end of year 1 and in year 2.

Once the children can use the concrete and pictorial approach, they will be able to write the abstract alongside.

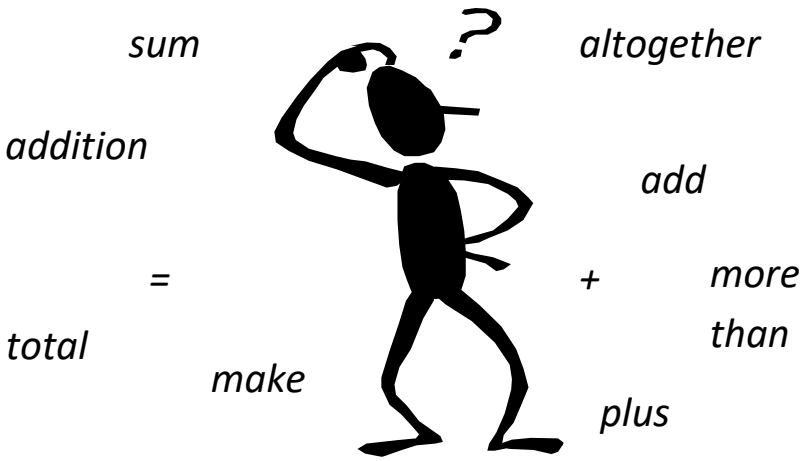
A – abstract – can we WRITE the calculation.

For example…

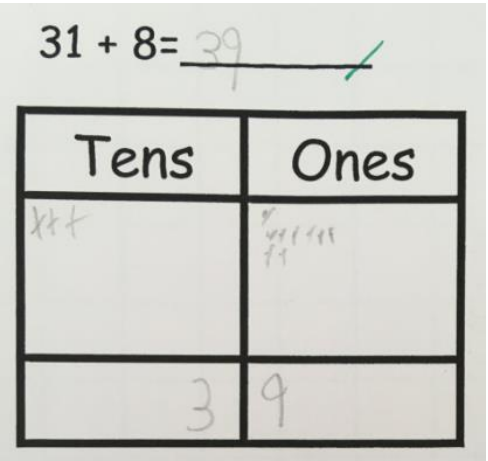
Concrete (can we MAKE it?)	**Pictorial (can we draw it?)**	**Abstract (can we write the calculation?)**
TO + O using base 10. Continue to develop understanding of partitioning and place value. 36 + 25  36 +25	Children to represent the base 10 or place value counters, in a place value chart  	Looking for ways to make 10. 36 + 25 = 30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 1 5 Formal method: 36 +25 61 1

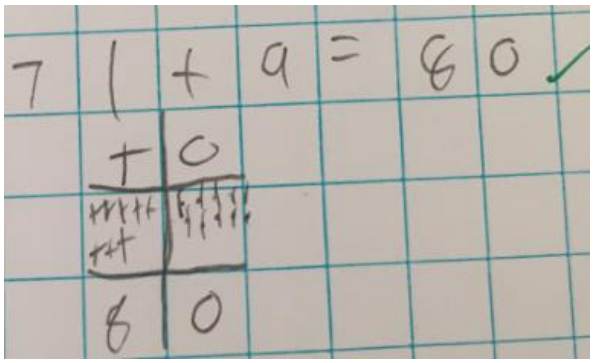
In year 3, you will here the word ‘exchange’. This means to ‘swap’ one 10 for ten 1’s, or one 100 for ten 10’s etc… It is used in all four operations.

<u>Addition</u>



To begin in year 3, children will continue using the ‘sticks and stones’ approach developed in KS1. They will have the addition of looking at hundreds numbers too, which are referred to as ‘flats’.

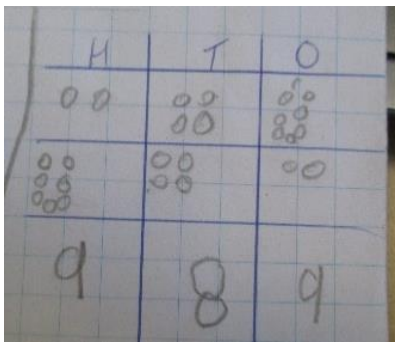




They will move on to using Place Value Counters. First of all using them to make the calculation (concrete) and then drawing the calculation (pictorial) as seen below.

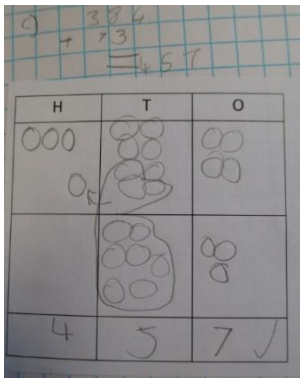
247 + 742 = 989

In this calculation, no exchange is necessary



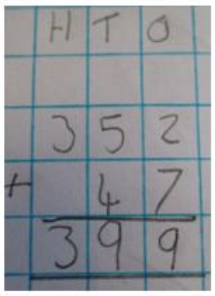
384 + 73 =

In this calculation, the child has had to exchange in the tens column as 80+70=150. You can see they have exchanged.

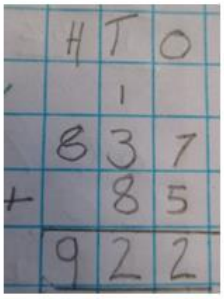


Once children are secure with the pictorial methods, we move on to column addition. Again, we use the word 'exchange' with the children to discuss moving numbers from one column to the next.

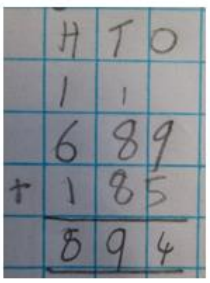
No exchange



exchange



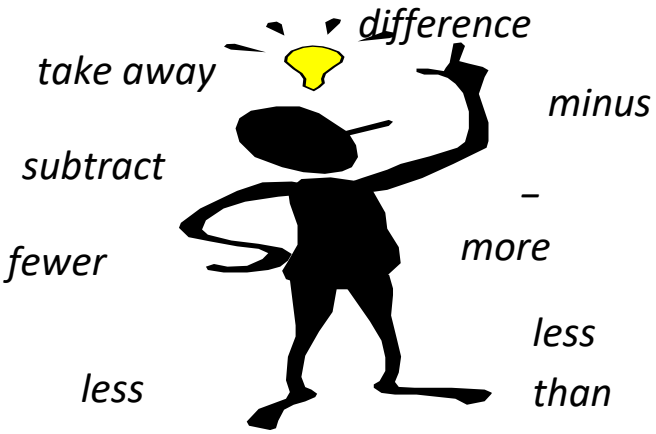
double exchange



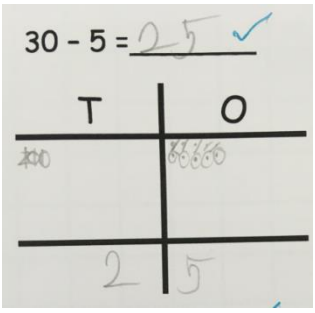
Moving into year 4, the children will develop on the skills from where they left year 3. They will also move to using Thousands, Hundreds, Tens and Ones.

We would hope that by the end of year 4, children have a good understanding and a secure method for addition, whether it is pictorial or abstract.

Subtraction

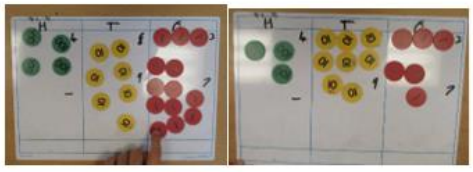


In year 3, children will continue the ‘sticks and stones’ approach from KS1. They will have the addition of hundreds as well, which we refer to as ‘flats’.



They will move on to using Place Value Counters. First of all using them to make the calculation (concrete) and then drawing the calculation (pictorial) as seen below.

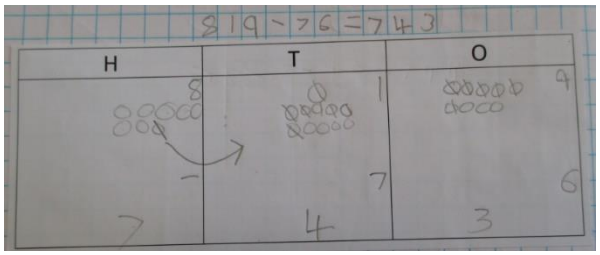
Writing the calculation and making the number.



Exchanging one 10 for ten 1’s and then subtracting the ones.

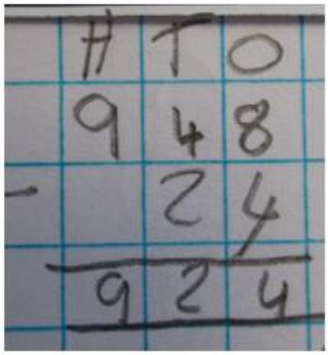
The child would then go on to exchange one 100 for ten ones.

Before completing the calculation.

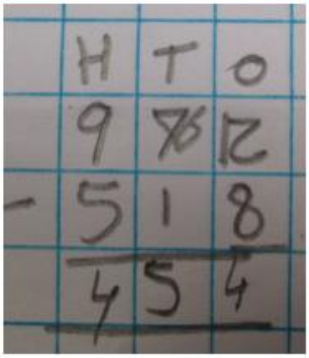


Once children are secure with the pictorial methods, we move on to column subtraction. Again, we use the word ‘exchange’ with the children to discuss moving numbers from one column to the next.

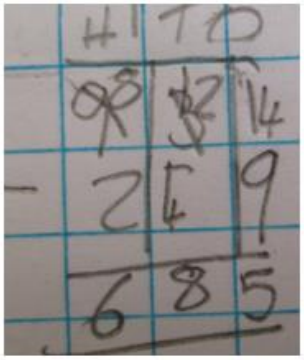
No exchange



exchange



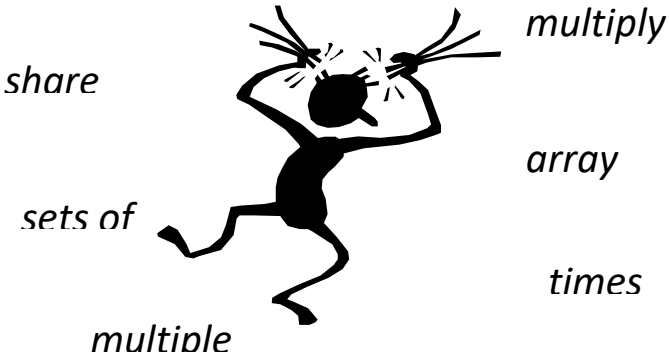
double exchange



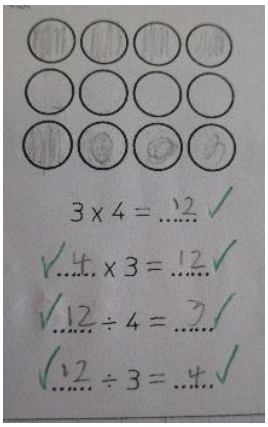
Moving into year 4, the children will develop on the skills from where they left year 3. They will also move to using Thousands, Hundreds, Tens and Ones.

We would hope that by the end of year 4, children have a good understanding and a secure method for subtraction, whether it is pictorial or abstract.

Multiplication



In year 3, the children will use arrays to draw the multiplication. They will find related division facts alongside as well.



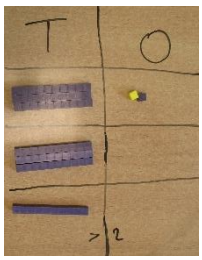
In year 3 the grid method is introduced for multiplication.

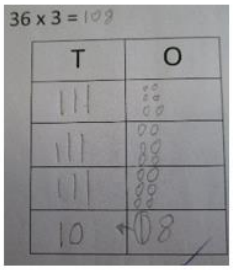
Concrete

23 x 3 = 69

Make 23 on each row, there are 3 rows.

Concrete 36 x 2 = 72, the children have exchanged 10 ones for 1 ten.





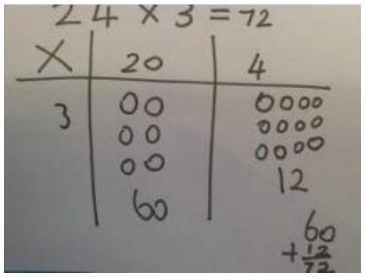
Pictorial

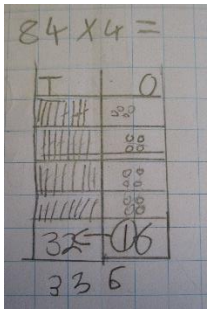
36 x 3

Make 36 on each row, there are 3 rows.

Children will then move on to drawing independently, using the grid method.

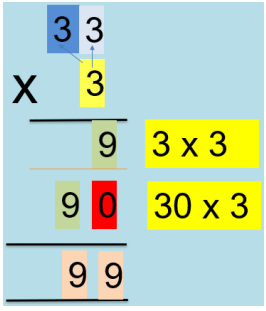
You can still see 24 on each row and 3 rows.



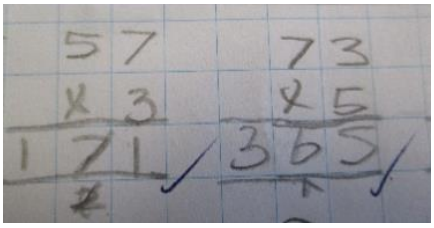


In year 4, children will begin to use a vertical written method of multiplication.

Expanded method



Compact method



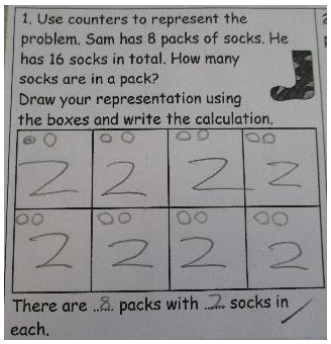
Please see the extra information regarding the year 4 multiplication tables check.

Division

In year 3 children will begin by continuing methods from year 2. There are various models that can be used to help the children represent their division.

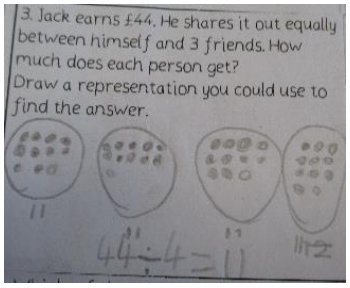
E.g.

16 ÷ 8 can be modelled as:



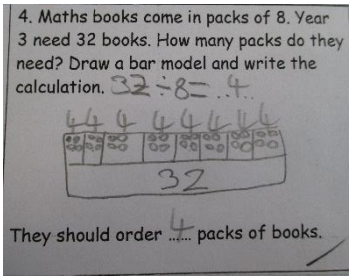
Children also use sharing circles

44 ÷ 4 can be modelled as:

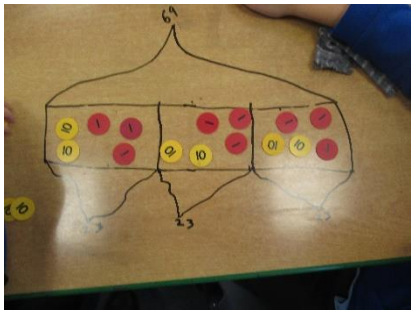


Children can also use the bar model.

32 ÷ 8 can be modelled as:

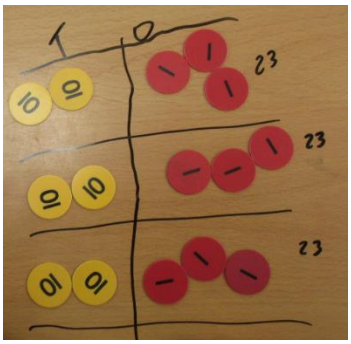


69 ÷ 3 can be modelled as:

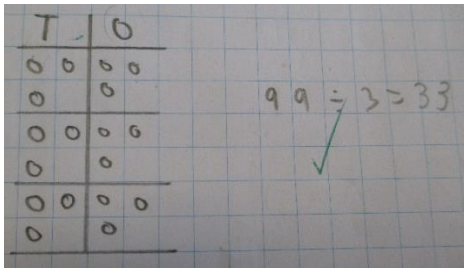


Using Place Value Counters

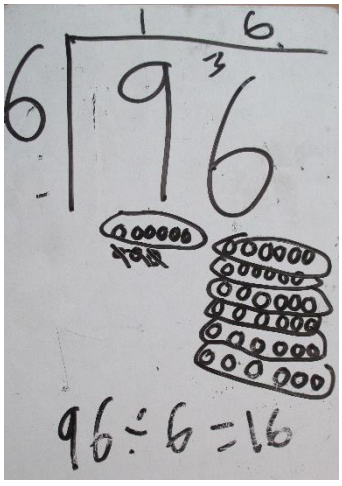
69 ÷ 3 = 23

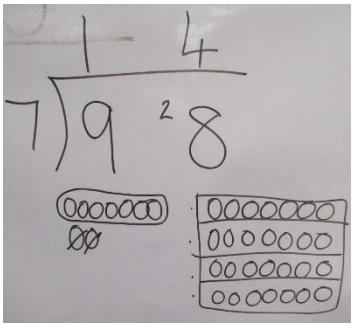


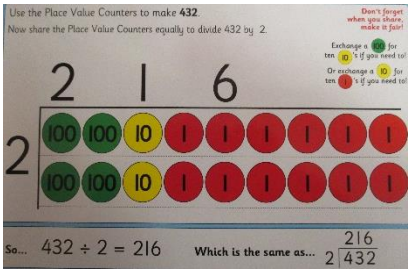
99 ÷ 3 = 33



Once a clear understanding of the methods has been shown, the children will move on to the ‘bus stop’ method. Concrete and pictorial methods can be used first to support before the abstract method.



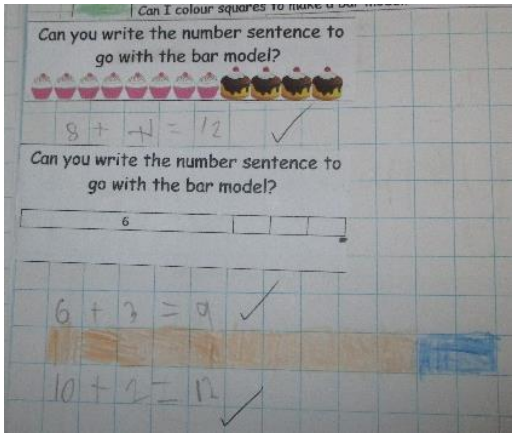




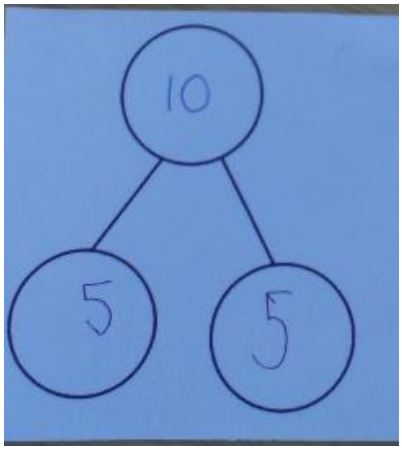
$$\begin{array}{r} 123 \\ 5\overline{)615} \\ {}^{1}\quad{}^{1} \end{array}$$

You may also hear these phrases. These are some of the models and images we use to support children.

Bar model

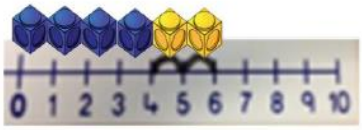


part-part-whole,



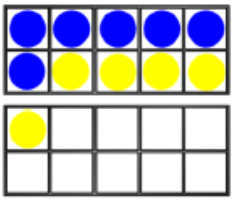
number line

Counting on using number lines using cubes or Numicon.

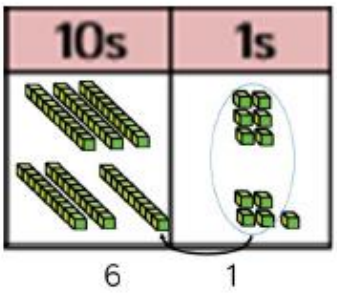


tens frame

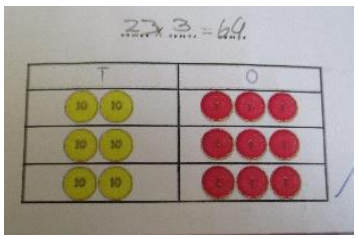
Children to draw the ten frame and counters/cubes.



base 10



place value counters



missing numbers,

Missing digit problems:

10s	1s
10 10	1
10 10 10	?
?	5

How you can help your child at home

- It is most important that you *talk & listen* to your child about their work in maths. It will help your child if they have to explain to you,
- Share the maths activity with your child and discuss it with them,
- Be positive about maths, even if you don't feel confident about it yourself,
- Remember, you are not expected to teach your child maths, but please share, talk and listen to your child,
- A lot of maths can be done using everyday situations and will not need pencil and paper methods,
- Play games and have fun with maths!