

## National Curriculum Programme of Study;

- Add numbers with up to three digits using formal written methods of columnar addition.
- Pupils use their understanding of place value and partitioning, and practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent. (non-statutory)
- Pupils practise solving varied addition and subtraction questions. (non-statutory)



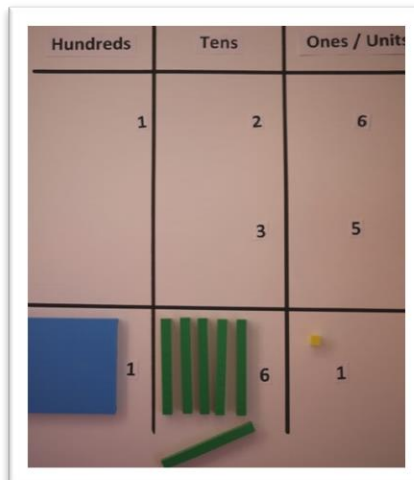
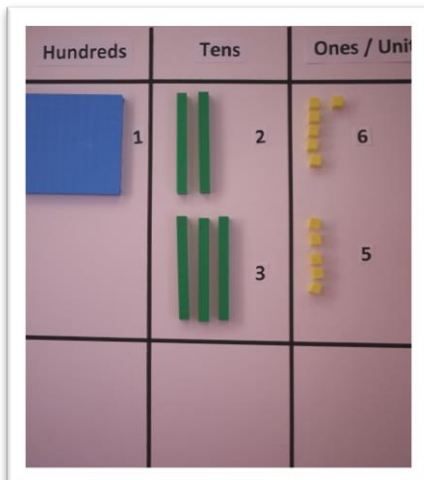
### BY THE END OF YEAR 3...

By the end of Year 3, children will be able to show their understanding as;

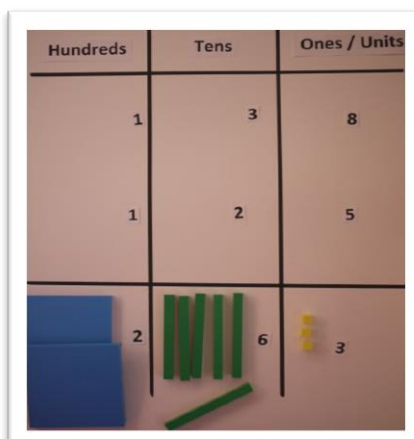
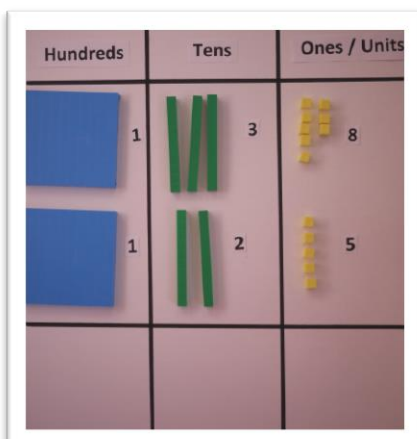
$$\begin{array}{r}
 189 \\
 + 642 \\
 \hline
 831 \\
 \hline
 1 \quad 1
 \end{array}$$

### Following on from year 2...

Using grouped objects for addition, with regrouping, and matched recording



Continue the good practice from Year 2, modelling the addition of two numbers (HTU + TU then HTU + HTU) using base 10 equipment and a baseboard. The value of the digits should be added to the baseboard throughout the calculation, to enable children to see the links between the practical model and the formal written method.

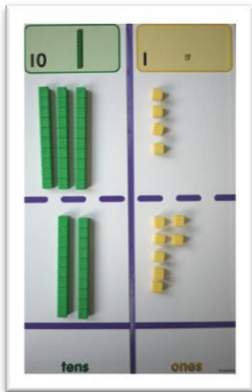


Continue to integrate the concept of addition and subtraction being the inverse of each other with questions such as; 'If I have 161 in my answer bar at the bottom of the grid, what might my grid have looked like at the start?' 'Can you find an example where I wouldn't need to regroup?'

## Introduction to formal column method

Once children have a secure conceptual understanding of the value of the digits in a calculation, and the relation of the annotated digits from the base board to the practical equipment, they can be moved on to a formal vertical written method for addition.

Initially this should be done alongside the practical model, and children should be encouraged to discuss 'what is the same and what is different'.

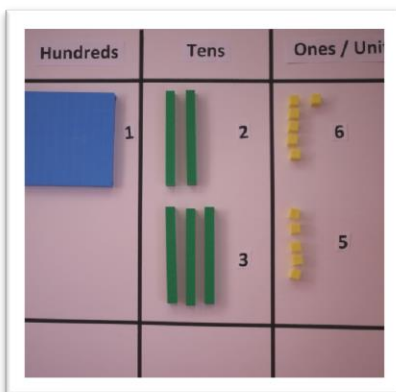


$$\begin{array}{r}
 34 \\
 + 27 \\
 \hline
 11 \\
 50 \\
 \hline
 61
 \end{array}$$

Show the children a 2-digit + 2-digit calculation using base 10 materials on a baseboard.  
*'What is my calculation? Which two numbers am I adding?'* Write the matching formal vertical calculation, alongside the baseboard.

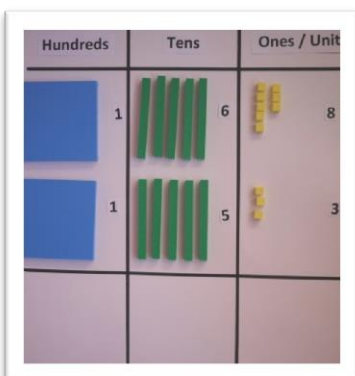
Refer to the different parts of calculation, encouraging the children to see what is the same and what is different. Repeat the physical action with the practical resource as before. At each stage, complete the formal written algorithm alongside. Encourage children to compare the two representations. Ask questions such as; *'What has happened to my 11 ones/units? How is this shown with the equipment? How is it shown here?'*

As children's conceptual understanding is embedded adding two 2-digit numbers, they should be provided with more challenging questions. Numbers should be extended to HTU + TU, then HTU + HTU. Take care to choose the numbers for questions carefully, introducing examples without regrouping, before expanded method (above) with regrouping, and then into the formal compact method



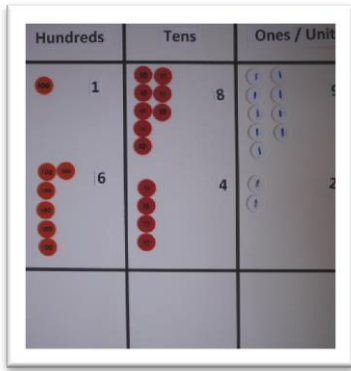
$$\begin{array}{r}
 126 \\
 + 35 \\
 \hline
 11 \\
 50 \\
 100 \\
 \hline
 161
 \end{array}$$

$$\begin{array}{r}
 126 \\
 + 35 \\
 \hline
 161 \\
 1
 \end{array}$$



$$\begin{array}{r}
 168 \\
 + 153 \\
 \hline
 11 \\
 110 \\
 200 \\
 \hline
 321
 \end{array}$$

$$\begin{array}{r}
 168 \\
 + 153 \\
 \hline
 321 \\
 11
 \end{array}$$



$$\begin{array}{r}
 189 \\
 + 642 \\
 \hline
 831 \\
 \hline
 11
 \end{array}$$

Base 10 Dienes equipment can be substituted with 'Place Value counters' once children are completely secure in the value of the digits and the base ten nature of our number system. These should be introduced in the same way as other resources, making use of the baseboard and with careful modelling of using exchange when regrouping.