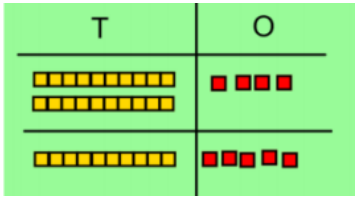
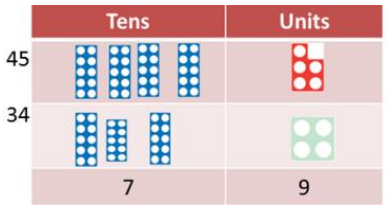
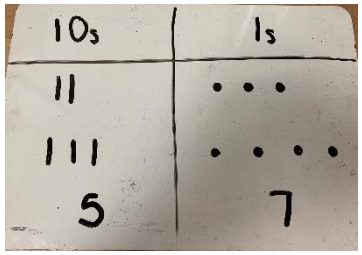
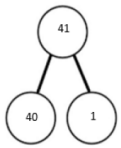
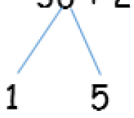
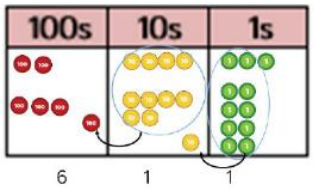
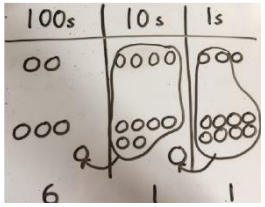
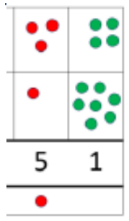
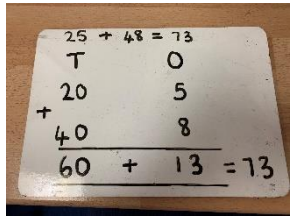
Wendover CE Junior School

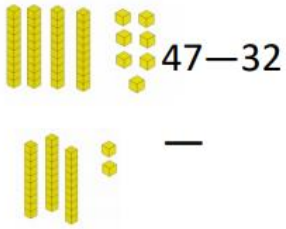
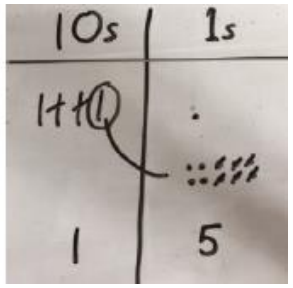
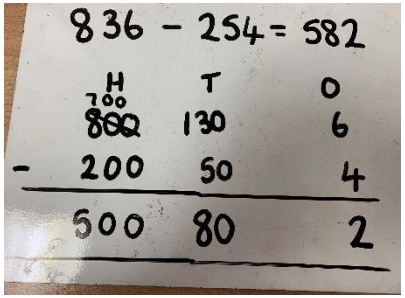
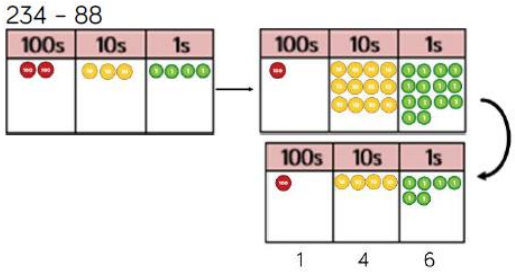
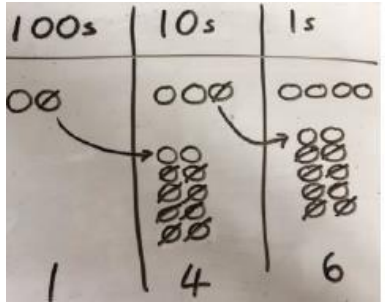
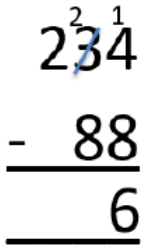
Wendover CE Junior School Calculation Policy

Addition

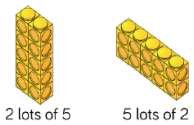
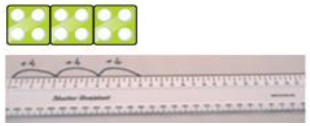
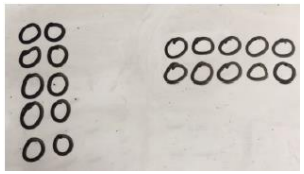
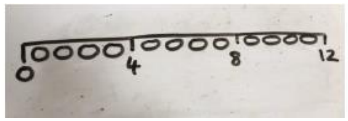
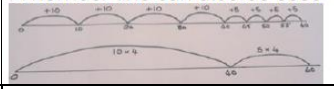
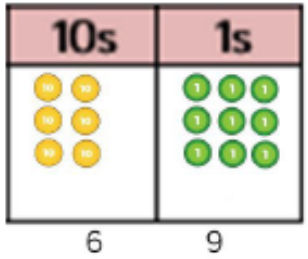
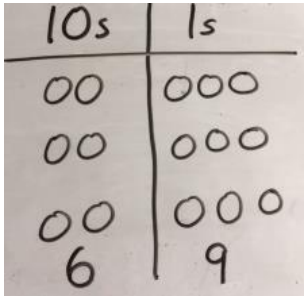
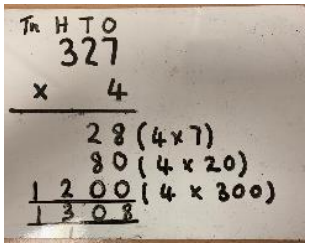
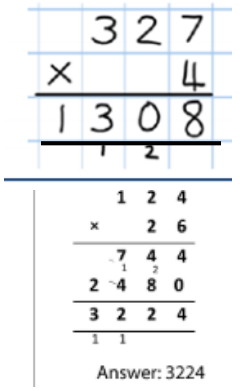
Concrete	Pictorial	Abstract
Model using dienes or numicon Add together the ones first and then the tens **24 + 15 = 39**  **45 + 34 = 79**  	Children move to drawing their own counters in a tens and ones frame. E.g. lines for tens and dots for ones. **23 + 34 = 57**  	Children to develop and understanding of equality. 41 + 8  1 + 8 = 9 40 + 9 = 49 Children look for ways to make 10. 36 + 25=  30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 36
Move to using place value counters to model column addition. When there are 10 ones in the 1s column, we exchange for 1 ten. When there are 10 tens in the 10s column, we exchange for 1 hundred. **243+ 368 = 611**  	Children to represent the counters in a place value chart, circling when they make an exchange. **243 + 368= 611**  **34 + 17 = 51**  Children can draw a representation of the grid to further support their understanding, carrying the ten **underneath** the line	**Formal column method** Start by partitioning the numbers to show the exchange clearly  243 +368 611 1 1

Reflection **Respect** **Responsibility** **Resilience**

Subtraction

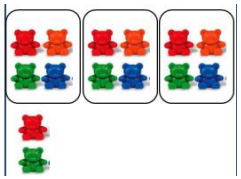
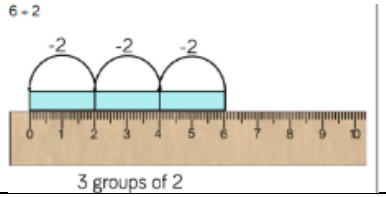
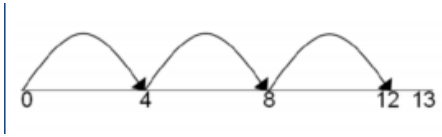
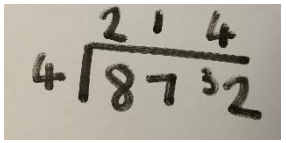
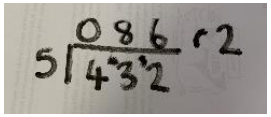
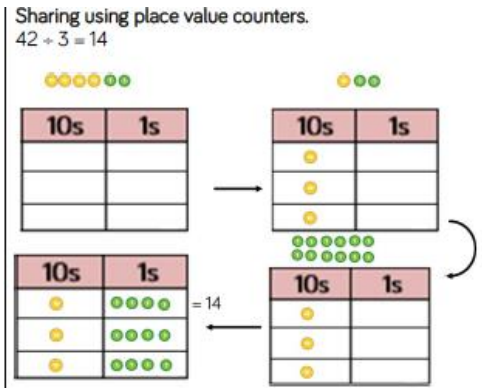
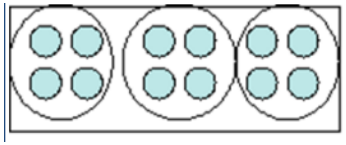
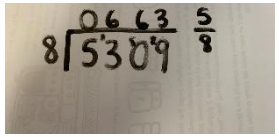
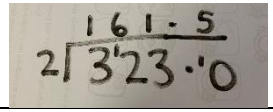
Concrete	Pictorial	Abstract
Use base 10 or numicon to model. Phsically take the base 10 or numicon away. 	Represent the base 10 pictorially, remembering to show the exchange. **41-26= 15** 	Begin by partitioning into place value columns. **836 – 254 = 582** . 
Use place value counters including exchanging **234 – 88 = 146** 	Represent the place value counters pictorially, remembering to show the exchange. **234-88= 146** 	**Formal column method.** Children must understand what has happened when they cross out the digits. 

Multiplication

Concrete	Pictorial	Abstract
Use arrays to illustrate commutativity. Counters and other objects can also be used. $2 \times 5 = 5 \times 2$  2 lots of 5 5 lots of 2 Number lines to show repeated groups.  **3 x 4 = 12**	Children to represent the arrays pictorially. **2 x 5 = 5 x 2**  Represent this pictorially alongside number line. 	Children to be able to use an array to write a range of calculations e.g. $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$ Children to be encouraged to show the steps they have taken. 4 × 15 10 5 10 × 4 = 40 5 × 4 = 20 40 + 20 = 60 A number line can also be used 
Formal column method with place value counters (base 10 can also be used). **3 x 23 = 69** 	Children to represent the counters pictorially. 	**Formal written method** **Expanded Method**  **Compact Method** 

Wendover CE Junior School

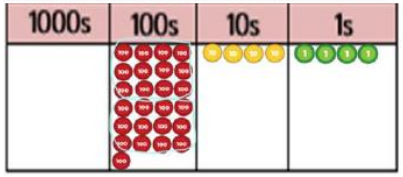
Division

Concrete	Pictorial	Abstract
Divide objects between groups and see how many are left over. **14 ÷ 3 = 4 r 2**  Repeated subtraction using Cuisenaire rods above a ruler. 	Jump forward in equal jumps on a number line. The see how many more you need to jump to find the remainder. **13÷ 4 = 3 r 1** 	Begin with divisions that divide equally with no remainder. **872 ÷ 4 = 872**  Move onto examples with a reminder. **432 ÷ 5 = 86 r2** 
	Students can continue to use drawn diagrams with dots or circles to help them to divide numbers into equal groups. Encourage them to move towards counting in multiples to divide more efficiently. **12 ÷ 3 = 4** 	Finally, move to showing remainders as fractions and as decimals. **5309 ÷ 8 = 663 $\frac{5}{8}$**  **323 ÷2 = 161.5** 

Long Division

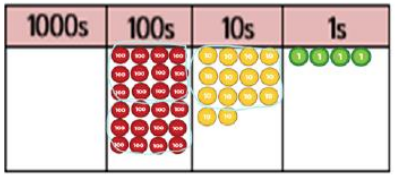
Long division using place value counters
2544 ÷ 12

We can't group 2 thousands into groups of 12 so will exchange them.



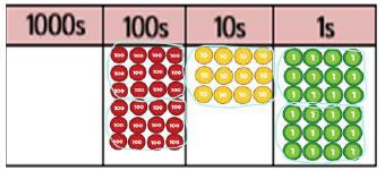
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$\begin{array}{r} 02 \\ 12\overline{)2544} \\ 24 \\ \hline 1 \end{array}$$



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$$



After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$