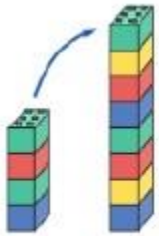
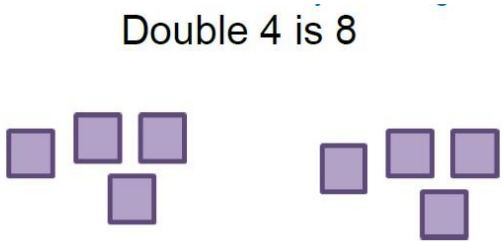
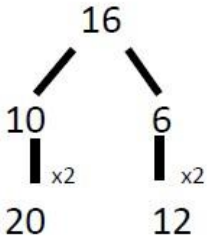
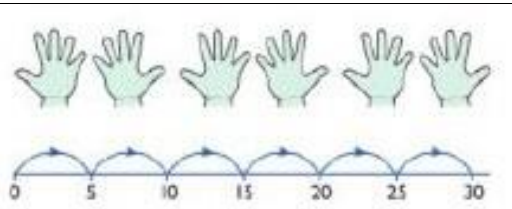
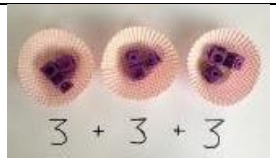
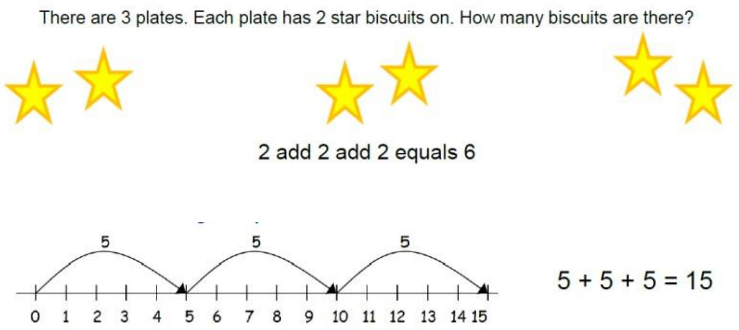
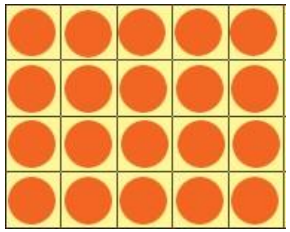
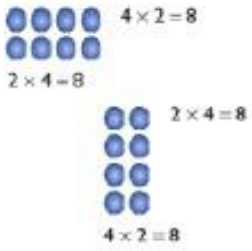
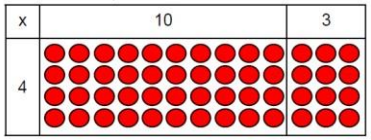
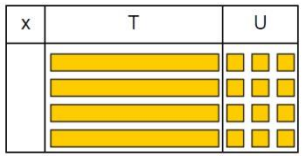
Tollesbury School – Progression in calculations

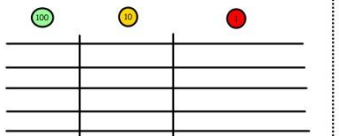
Multiplication

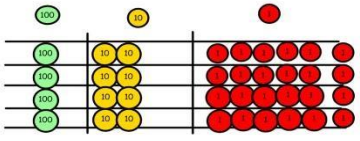
Objective and strategies	Concrete	Pictorial	Abstract
Year 1 and 2 **Doubling**	Use practical activities to show how to double a number.  double 4 is 8 4 × 2 = 8	Draw pictures to show how to double a number.  	Partition a number and then double each part before recombining it back together. 
Year 1, 2 and 3 **Counting in multiples**	 Count in multiples supported by concrete objects in equal groups.	 Use a number line or pictures to continue support in counting in multiples.	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25, 30

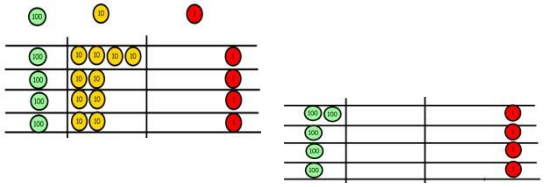
Year 2 and 3 **Repeated addition**	 	 Use different objects to add equal groups.		Write addition sentences to describe objects and pictures.
Year 2 and 3 **Arrays – showing commutative multiplication**	Create arrays using counters/ cubes to show multiplication sentences. 	Draw arrays in different rotations to find **commutative** multiplication sentences.  	Use an array to write multiplication sentences and reinforce repeated addition. 5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15	
Year 3 Grid method	Show the link with arrays to first introduce the grid method.  4 rows of 10 4 rows of 3 Move on to using Base 10 to move towards a more compact method.	Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. **210 + 35 = 245**	

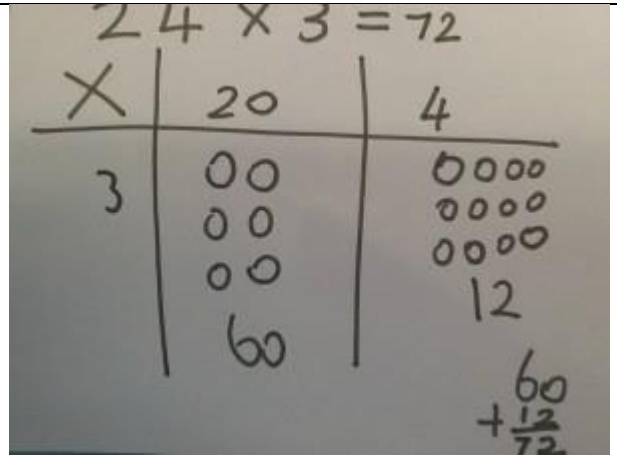
<table>
<tr>
<td></td>
<td>


4 rows of 13

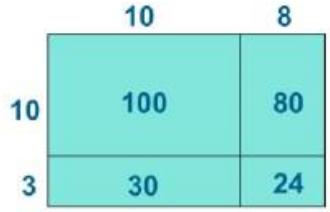
Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.

Calculations
4 x 126

Fill each row with 126.

Calculations
4 x 126

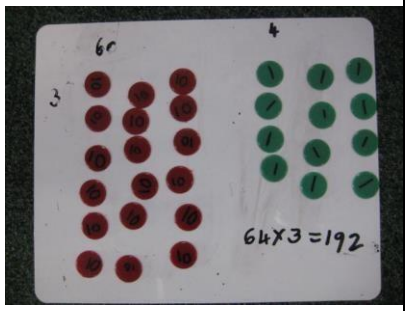
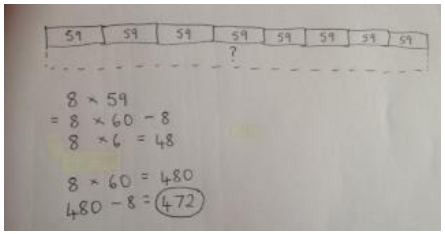
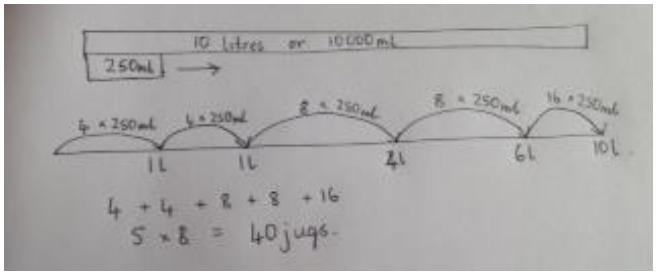
Add up each column, starting with the ones making any exchanges needed.


Then you have your answer.</td>
<td>


</td>
<td>
Moving forward, multiply by a 2-digit number showing the different rows within the grid method.



<table>
<tr><td>X</td><td>1000</td><td>300</td><td>40</td><td>2</td></tr>
<tr><td>10</td><td>10000</td><td>3000</td><td>400</td><td>20</td></tr>
<tr><td>8</td><td>8000</td><td>2400</td><td>320</td><td>16</td></tr>
</table>
</td>
</tr>
</table>

Year 4 Column multiplication (2, 3 and digit multiplied by 1 or 2-digit number) (same method for multiplying decimals by a 1 digit number) **Year 5** (up to 4 digit numbers multiplied by 1 or 2 digits) **Year 6** (multiply numbers up to 4 digits by a 2 digit number)	Children can continue to be supported by place value counters at the stage of multiplication. It is  important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.	Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.  	Start with long multiplication, reminding the children about lining up their numbers clearly in columns. If it helps, children can write out what they are solving next to their answer. 32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 74 x 63 12 210 240 + 4200 4662 This moves to the more compact method. (move to this method as quickly as chn are able to)