
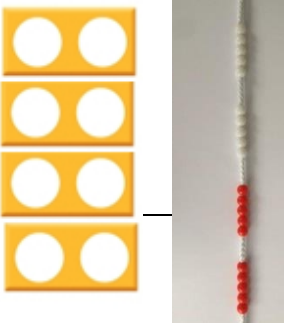
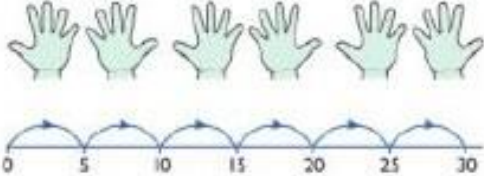


**Multiplication:** Children should be taught to choose the best method for multiplication – repeated addition may sometimes be a reasonable method when doubling or multiplying by 3. When finding 4 lots of something, it may be most efficient to double and double again. It may also be most efficient to count on to find the answer for example, 5 lots of 25: “I know 4 lots of 25 are 100, so I need one more 25, which is 125” Teach the children to step count forwards, or backwards, from a known fact. Eg: “I know that 5 lots of 3 are 15, so 6 3’s in one more 3, it’s 18.” Or “I know 10 8’s are 80, so 8 8’s would be 80 – 8, which is 72.”

Objective and Strategies	Concrete	Pictorial	Abstract
<p><b>Step counting</b> Children will first experience multiplication through step counting</p>	<p>Model step counting using objects. Apply to plates of biscuits, people in cars, sheep in field etc. Say, while pointing to the biscuits: “1 plate of 2 biscuits, 2 plates of 2 biscuits, 3 plates of 2 biscuits etc” and “2,4,6” “3 plates of 2 biscuits” “3 lots of 2 biscuits”</p>  <p>Model step counting using equipment. Explain using a variety of vocabulary: “4 lots of 2” “4 groups of 2” “4 sets of 2” “4 2’s” “4 multiplied by 2”</p> 	 <p>Use a number line or pictures to continue support in counting in multiples.</p>	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>



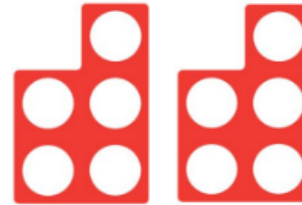
**Doubling**  
 Children must learn that their 2 times table is the same as doubling. Ensure that the two times table is modelled as doubling from the outset, e.g.  $2 \times 1$ ,  $2 \times 2$ ,  $2 \times 3$ , which we would read as 2 ones, 2 twos, 2 threes etc.

Using equipment or a mat with two defined areas, children show doubles stories.

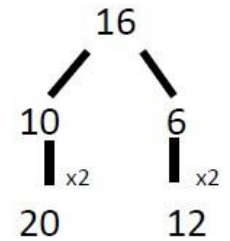
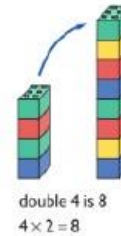
e.g. There are 4 ducks on each pond. In total, there are 8 ducks.





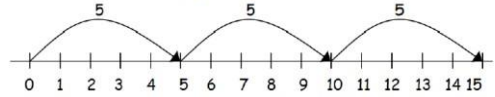
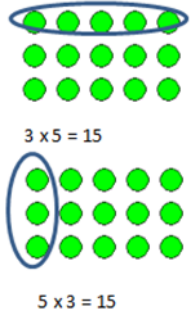
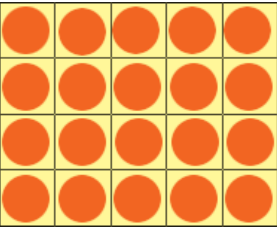


Children to use Numicon or multilink cubes to show doubling.



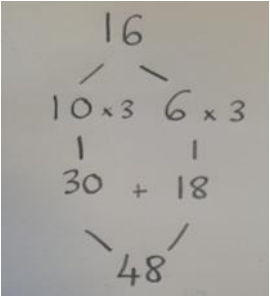


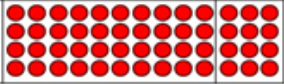

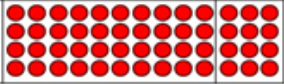

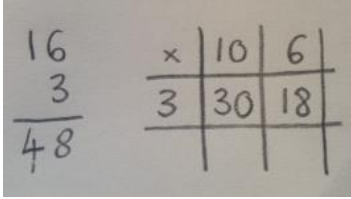
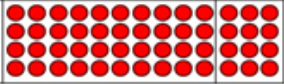

Draw pictures to show doubling

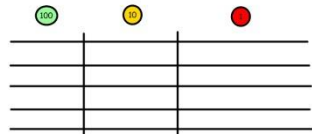


Partition a number and then double each part before recombining it back together.

<p><b>Repeated addition</b></p>	 <p>Use different objects to add equal groups.</p>	<p>There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?</p>   <p><math>5 + 5 + 5 = 15</math></p>	<p>Write addition sentences to describe objects and pictures.</p>
<p><b>Arrays- showing commutative multiplication</b></p>	<p>Create arrays using counters/ cubes to show multiplication sentences.</p> 	<p>Draw arrays in different rotations to find <b>commutative</b> multiplication sentences.</p>  <p>Link arrays to area of rectangles.</p>	<p>Use an array to write multiplication sentences and reinforce repeated addition.</p>
<p><b>Area</b> <i>Area is a really good opportunity to practically apply multiplication skills. This links to arrays particularly if you use gridded</i></p>	<p>Using the Perspex tiles build shapes with a given area ie 12 squares</p> 	<p>Use Cuisenaire rods to build shapes with a given area.</p> 	<p>Length x width = area <math>3\text{cm} \times 4\text{cm} = 12\text{cm}</math></p>

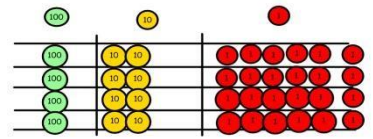
<p><i>paper to show the area of shapes.</i></p>			
<p><b>Multiplying by 10,100,1000</b></p>	<p>Use the place value chart to show that number gets 10 times bigger each time it moves to the left. Use dienes to support.</p> 	<p>Draw a place value chart and draw the dienes, to show the numbers getting ten times bigger</p>	<p>Still encourage the use of a place value chart – children may still want to draw this quickly to support their thinking. Move the digits to the left as they are multiplied by 10, 100 or 1000.</p>
<p><b>Multiplying TU by U using partitioning</b></p>	<p>Use dienes to model partitioning the number into tens and units, then multiplying each number.</p> <p>16 x 3</p> 	<p>Children can draw the dienes to support them with their partitioning.</p>	<p>16 x 3</p>  <p>Teach mental strategies too:</p> <ul style="list-style-type: none"> <li>• To multiply by 9, multiply by 10 and take away one lot.</li> <li>• To multiply by 5, multiply by 10 and then halve.</li> <li>• Doubling and doubling</li> </ul>

			<p>again is the same as <math>\times 4</math></p> <ul style="list-style-type: none"> <li>• To multiply by 20, double then times by 10 or other way round</li> <li>• Multiplying by 50 is multiplying by 100 and halving.</li> <li>• Multiplying by 8 is doubling, doubling and doubling again</li> </ul>												
<p><b>Multiplying TU and HTU by U using the formal method, supported by the grid method.</b></p>	<p><b><u>TU x U and HTU x U – Moving on to Short Multiplication – Using the Grid Method to support teaching</u></b></p> <p>Show the link with arrays to first introduce the grid method.</p> <table border="1" data-bbox="344 783 658 898"> <tr> <td>x</td> <td>10</td> <td>3</td> </tr> <tr> <td>4</td> <td colspan="2">  </td> </tr> </table> <p>4 rows of 10 4 rows of 3</p> <p>Move on to using Base 10 to move towards a more compact method.</p> <table border="1" data-bbox="344 1002 638 1150"> <tr> <td>x</td> <td>T</td> <td>U</td> </tr> <tr> <td></td> <td colspan="2">  </td> </tr> </table> <p>4 rows of 13</p> <p>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.</p>	x	10	3	4			x	T	U					
x	10	3													
4															
x	T	U													
															



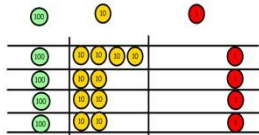
Calculations  
4 x 126

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.

**Multiplying TU by TU and HTU**

**Mentally with jottings:**

Some TU x TU multiplications can be solved using mental methods and jottings. It is worth spending time exploring the possible jottings. TU x 15/25 would be suitable numbers to do this with.

$$15 \times 18$$

$$15 \times 10 = 150$$

$$15 \times 4 = 60 \times 2 = 120$$

$$\begin{array}{r} 150 \\ 120 \\ \hline 270 \end{array}$$

$$15 \times 18$$

$$18 \times 15$$

$$18 \times 10 = 180$$

$$180 \div 2 = 90$$

$$180 + 90 = 270$$

**TU xTU – Long Multiplication**

Keep everything in place value columns. Treat everything as a unit and start with units.

Insert a 0 as a place holder in the second line. Explain that in this line you are dealing with multiples of 10 so there will be no digits in the units column.

Model with grid method if necessary.

Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.

If it helps, children can write out what they are solving next to their answer.

$$\begin{array}{r} 32 \\ \times 24 \\ \hline 8 \quad (4 \times 2) \\ 120 \quad (4 \times 30) \\ 40 \quad (20 \times 2) \\ 600 \quad (20 \times 30) \\ \hline 768 \end{array}$$

$$\begin{array}{r} 24 \\ \times 16 \\ \hline 144 \\ 240 \\ \hline 384 \end{array}$$

$$8 \times 54$$

$$= 8 \times 60 - 8 \times 6$$

$$= 480 - 48$$

$$= 432$$

