

Progression in Written Methods for Multiplication and Division

Multiplication	Division							
<p style="text-align: center;"><u>Practical activities and picture representations</u></p> <div style="text-align: center;"> </div> <p>Concrete apparatus models the repeated addition (multiplication) of 3 sets of 2 objects. Using number stories to support the concept e.g. Three friends have 2 apples each, how many do we have altogether?</p> <p>Recording story, picture representations and practical equipment as $2+2+2=6$</p>	<p style="text-align: center;"><u>Practical activities and picture representations</u></p> <div style="text-align: center;"> </div> <p>Concrete apparatus models the sharing of 15 objects into 3 sets. Using number stories to support the concept e.g. Three friends share 15 apples between them, how many do they get each?</p> <p>Recording story, picture representations and practical equipment as $15 \div 3 = 5$</p>							
<p style="text-align: center;"><u>Making Sets and Repeated Addition</u></p> <p>3×5 ("3 sets of 5")</p> <div style="text-align: center;"> </div> <p>(pupils will revert to counting each on in turn)</p> <div style="text-align: center;"> </div> <p style="text-align: center;">$5 + 5 + 5 = 15$</p>	<p style="text-align: center;"><u>Sharing and Grouping</u></p> <p>Sharing: $15 \div 3 = 5$</p> <div style="text-align: center;"> </div> <p>Grouping: $15 \div 3 = 5$</p> <div style="text-align: center;"> </div>							
<p style="text-align: center;"><u>Arrays and Repeated Addition</u></p> <p style="text-align: center;">Showing that multiplication is commutative</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: left;"> <p>8×4</p> <p>$4+4+4+4+4+4+4+4$</p> </div> <div style="text-align: left;"> <p>4×8</p> <p>$8+8+8+8$</p> </div> </div>	<p style="text-align: center;"><u>Arrays</u></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: left;"> <p>$28 \div 8 = 4$</p> <p>4 8 12 16 2 24 2 32 (using repeated addition as the inverse to support calculation)</p> </div> <div style="text-align: left;"> <p>$28 \div 8 = 4 \text{ r } 4$</p> </div> </div>							
<p style="text-align: center;"><u>Repeated addition on an Empty Number Line</u></p> <p>3×5 (3 jumps / lots of 5) = 15</p> <div style="text-align: center;"> </div> <p>6×3 (6 jumps / lots of 3)</p> <div style="text-align: center;"> </div>	<p style="text-align: center;"><u>Repeated Subtraction on an Empty Number Line</u></p> <p>$9 \div 3 = 3$</p> <div style="text-align: center;"> </div> <p>$23 \div 7 = 3 \text{ r } 2$</p> <div style="text-align: center;"> </div>							
<p style="text-align: center;"><u>Simple Grid Multiplication</u></p> <p>$13 \times 5 = 65$</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X</td> <td>10</td> <td>3</td> </tr> <tr> <td>5</td> <td>50</td> <td>15</td> </tr> </table> <p>$50 + 15 = 65$</p>	X	10	3	5	50	15	<p style="text-align: center;"><u>Simple Expanded Column</u></p> $\begin{array}{r} 13 \\ \times 5 \\ \hline 15 \text{ (5 x 3)} \\ 50 \text{ (5 x 10)} \\ \hline 65 \end{array}$	<p style="text-align: center;"><u>Chunking</u></p> <p>$72 \div 6 = 12$</p> $\begin{array}{r} 6 \overline{) 72} \\ - 60 \\ \hline 12 \\ - 12 \\ \hline 00 \end{array}$ <p>Larger jumps can be used for larger numbers e.g. $20 \times 6 = 120$</p> <p>Remainders can also be found using this method.</p>
X	10	3						
5	50	15						
<p style="text-align: center;"><u>Compact Column</u></p> $\begin{array}{r} 654 \\ \times 15 \\ \hline 3270 \\ 322 \\ \hline 6540 \\ 9810 \\ \hline 1 \end{array}$	<p style="text-align: center;"><u>'Bus Shelter' – Compact Division</u></p> $12 \overline{) 196} \begin{array}{l} 16 \text{ r } 4 \\ \end{array}$ <p>Some children will be able to understand and use this compact method for division.</p>							

