

Moorland Primary School



The route for Maths

This document is designed to support staff in essential tenets in teaching Mathematics.

Fundamental to our strategy is the approach of teaching concrete, pictorial and abstract methods to support pupils' understanding of mathematical concepts.

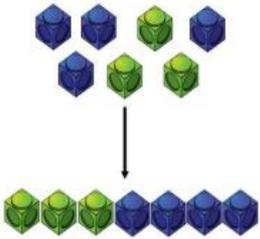
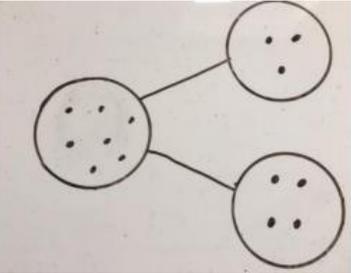
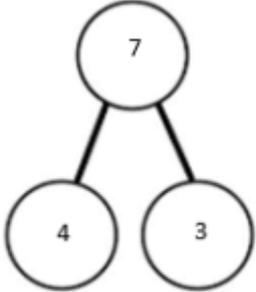
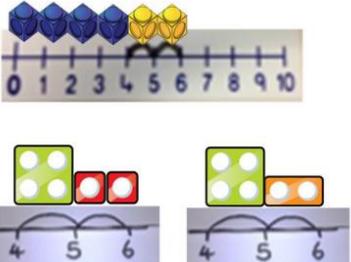
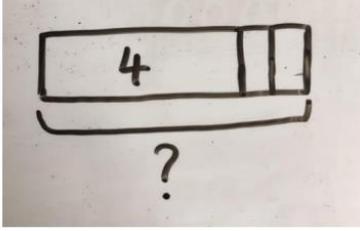
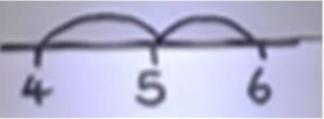
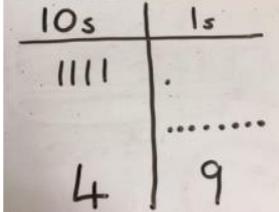
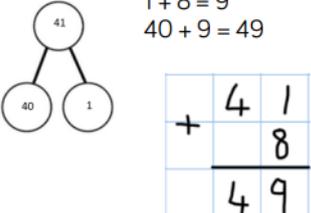
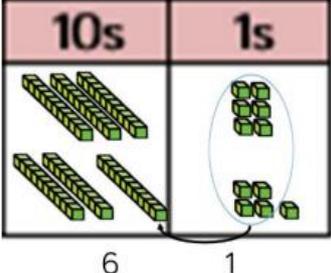
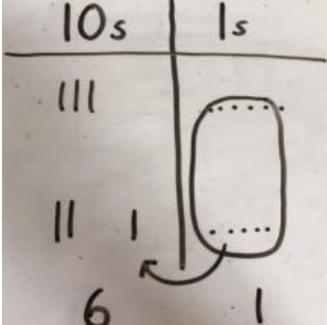
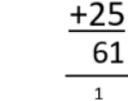
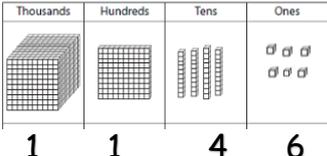
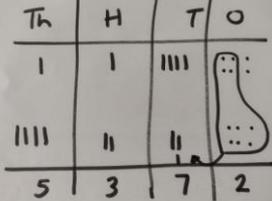
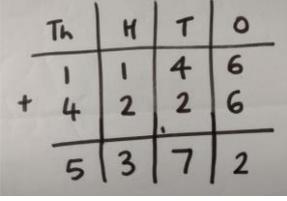
These principles should be interwoven throughout.

Do not be too quick to move through the stages (C→P→A). Move only when the children are ready. The CPA approach is also helpful in problem solving at all levels. Visualising a problem and drawing it pictorially can help pupils make sense of it. Recording findings systematically is similarly supportive in being able to justify answers to more complex investigations.

It is equally valid for older pupils to explore their mathematical thinking. This is particularly useful in problems solving where pupils should represent the questions.

Some examples are outlined below.

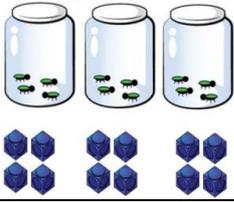
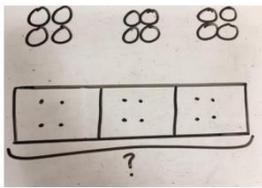
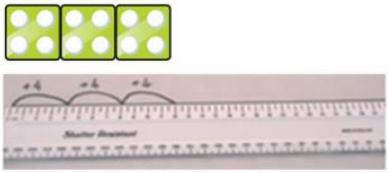
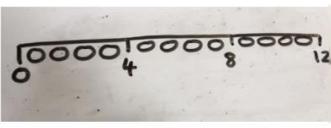
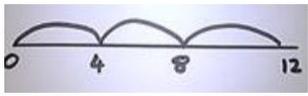
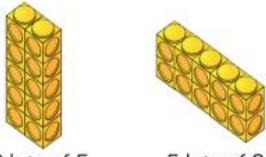
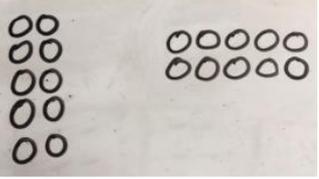
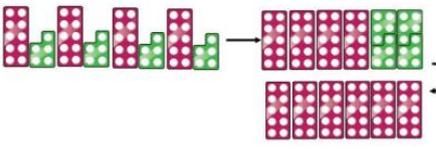
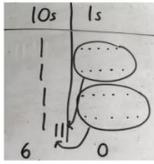
Addition

Concrete	Pictorial	Abstract
		
		
		<p>41 + 8</p> <p>1 + 8 = 9 40 + 9 = 49</p> 
		<p>36 + 25 =</p> <p>30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61</p> <p>1 5</p> <p>Formal method:</p> 
		

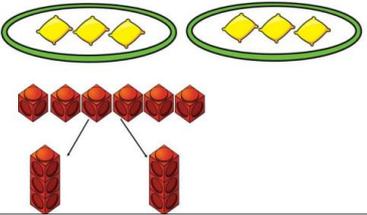
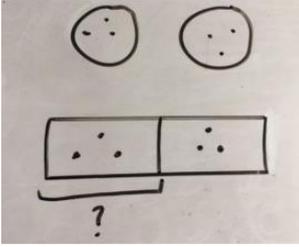
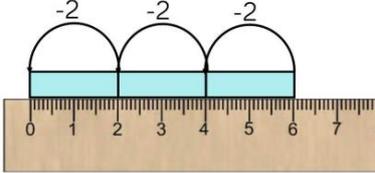
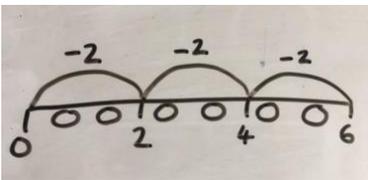
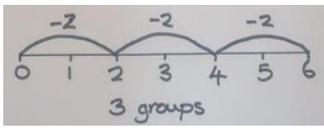
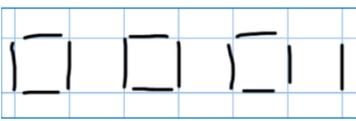
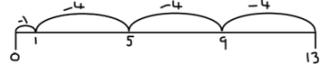
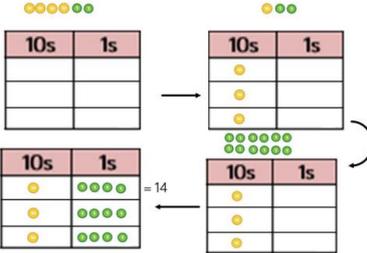
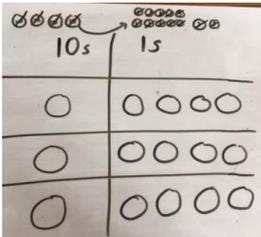
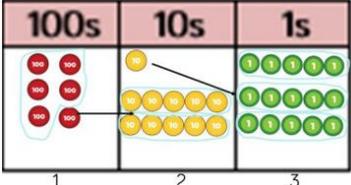
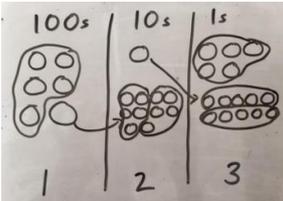
Subtraction

Concrete	Pictorial	Abstract
<p>6 - 2 = 4</p>		
		<p>8 - 5, the difference is <input type="text"/></p> <p>Children to explore why $9 - 6 = 8 - 5 = 7 - 4$ have the same difference.</p>
		<p>14 - 5 = 9</p> <p>14 - 4 = 10 10 - 1 = 9</p>

Multiplication

Concrete	Pictorial	Abstract																		
		$4 + 4 + 4 = 12$																		
																				
 <p>2 lots of 5 5 lots of 2</p>		$10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$																		
		<p>they have</p> 4×15 $\swarrow \searrow$ $10 \quad 5$																		
<table border="1" data-bbox="215 1326 422 1489"> <tr> <th>10s</th> <th>1s</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>6</td> <td>9</td> </tr> </table>	10s	1s			6	9	<table border="1" data-bbox="683 1317 869 1496"> <tr> <th>10s</th> <th>1s</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>6</td> <td>9</td> </tr> </table>	10s	1s			6	9	3×23 $3 \times 20 = 60$ $20 \quad 3$ $3 \times 3 = 9$ $60 + 9 = 69$						
10s	1s																			
6	9																			
10s	1s																			
6	9																			
<table border="1" data-bbox="215 1556 383 1646"> <tr> <th>100s</th> <th>10s</th> <th>1s</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <table border="1" data-bbox="215 1668 383 1758"> <tr> <th>100s</th> <th>10s</th> <th>1s</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	100s	10s	1s				100s	10s	1s				<table border="1" data-bbox="683 1556 925 1758"> <tr> <th>100s</th> <th>10s</th> <th>1s</th> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	100s	10s	1s				$6 \times 23 =$
100s	10s	1s																		
100s	10s	1s																		
100s	10s	1s																		

Division

Concrete	Pictorial	Abstract		
 <p>Two groups of 3 yellow diamonds. Six red cubes are shown, with two groups of three cubes each.</p>	 <p>Two circles, each containing 3 dots. A rectangle contains 6 dots, divided into two equal parts, with a bracket and a question mark below.</p>	$6 \div 2 = 3$ <table border="1" data-bbox="1062 450 1353 501"> <tr> <td>3</td> <td>3</td> </tr> </table>	3	3
3	3			
 <p>A ruler from 0 to 8. Three arcs of length 2 are drawn from 0 to 2, 2 to 4, and 4 to 6.</p>	 <p>A horizontal line with 6 circles below it. Three arcs of length 2 are drawn above the line, labeled -2, -2, -2. The circles are numbered 0, 2, 4, 6.</p>	 <p>A number line from 0 to 6. Three arcs of length 2 are drawn, labeled -2, -2, -2. Below the line, it says "3 groups".</p>		
 <p>Three groups of 4 yellow rectangles. One single yellow rectangle is shown below.</p>	 <p>A 12x4 grid with three vertical lines dividing it into three equal sections.</p>	 <p>A number line from 0 to 13. Three arcs of length 4 are drawn, labeled -4, -4, -4.</p>		
 <p>Two place value charts for 10s and 1s. The first chart shows 4 tens and 2 ones. The second chart shows 3 tens and 12 ones, with a bracket and "=14" below.</p>	 <p>Place value blocks for 42 (4 tens rods, 2 ones units) divided into three groups. Labels "10s" and "1s" are present.</p>	$42 \div 3$ $42 = 30 + 12$ $30 \div 3 = 10$ $12 \div 3 = 4$ $10 + 4 = 14$		
 <p>Place value blocks for 615 (6 hundreds, 1 ten, 5 ones) divided into three groups. Labels "100s", "10s", "1s" are present.</p>	 <p>Place value blocks for 615 divided into three groups. Labels "100s", "10s", "1s" are present.</p>	$5 \overline{) 615}$		