

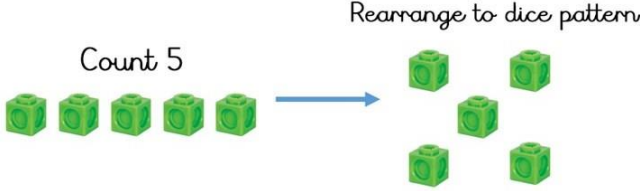
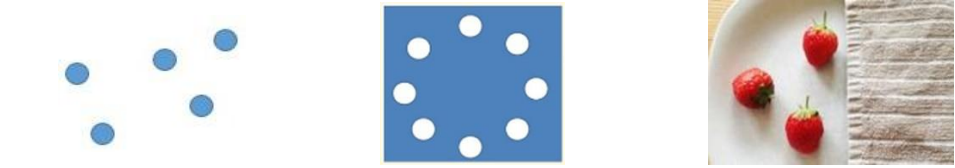


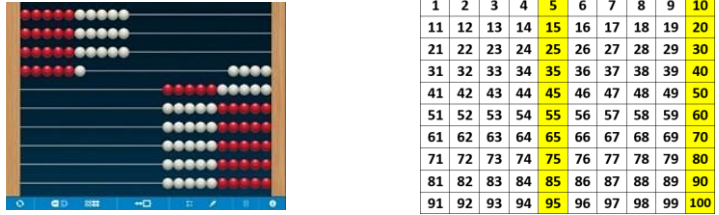


Progression of Visual Representations






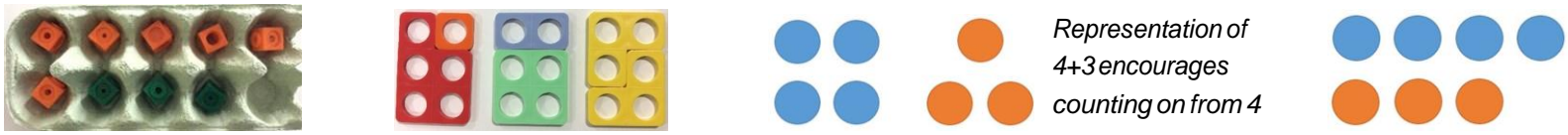
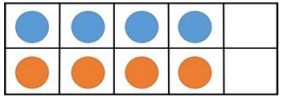
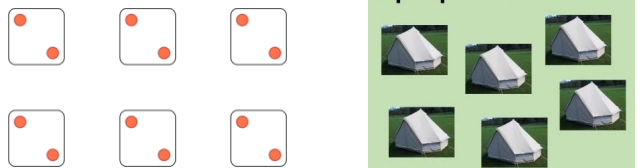
At Crooks Barn, we realise the importance of using concrete, pictorial and abstract approaches. Particularly, how these can help to develop children's conceptual and procedural understanding of number and calculation strategies. Below is a document adapted from the representations seen at www.iseemaths.com and the White Rose Maths resources, that aims to show the progression of visual representations throughout our school.

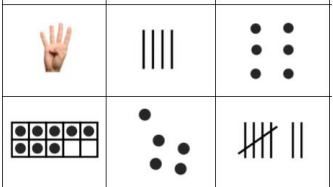

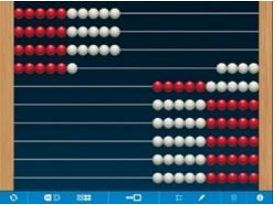

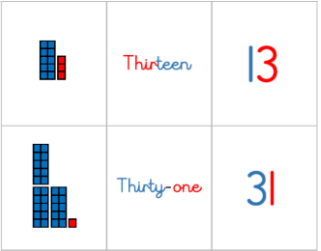
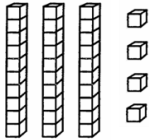
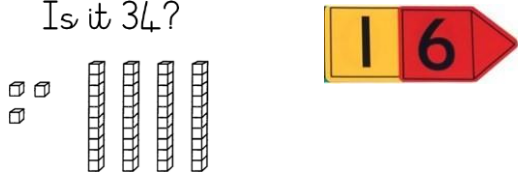


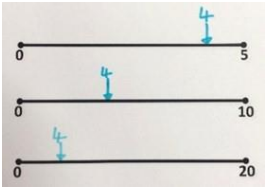

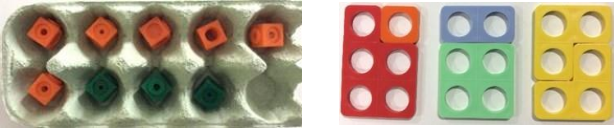
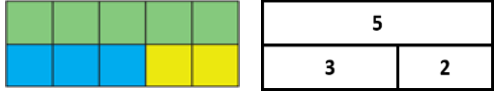
This list is not exhaustive; however, it gives an outline of the representations used throughout school. It shows how some representations are carried through school and how others are in place to support future learning.

Objective	Visual representations																																																																																																					
<p>Count reliably with numbers from 1-20</p>	<p>For 1:1 counting, number sounds are clearly separated and items counted with exaggerated movements. Counted objects are rearranged in regular patterns to support quantity recognition.</p> <p style="text-align: center;">Rearrange to dice pattern</p> 	<p>Children learn that each object is counted once and the last number is the total for the set—count small sets in irregular arrangements. Progress by counting out items from larger set; objects that can't be moved; make objects not visible once counted; count movements and sounds. Counting on taught by counting two sets, then screening one of the counted sets.</p> 																																																																																																				
<p>Identify and use numerals</p>	<p>Children match numerals to different representations of number for quantities 1-10 (see 'knowledge of numbers as quantities') e.g. making and finding 5 in different ways. Children learn that 'teen' represents 10 and match teen/ten visual cards. Place value arrow cards used for partitioning and combining tens and units.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" data-bbox="336 758 705 965"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <p data-bbox="705 766 884 917"><i>Different representations matched to numerals</i></p> <table border="1" data-bbox="1064 726 1377 973"> <tr> <td></td> <td>Thirteen</td> <td>13</td> </tr> <tr> <td></td> <td>Thirty-one</td> <td>31</td> </tr> </table>  </div>									Thirteen	13		Thirty-one	31																																																																																								
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<p>Understand 10 as a unit</p>	<p>Items are counted into groups of 10, for example pipe cleaners bundled into 10s or items counted into 10-frames. Children recognise quantities in multiple 10-frames as 'how many tens, how many ones'.</p> 	<p>Children count tens/ones on beads. Coloured 100-square supports counting intens.</p>  <table border="1" data-bbox="1724 1093 2027 1316"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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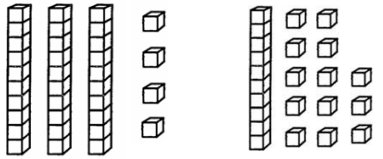



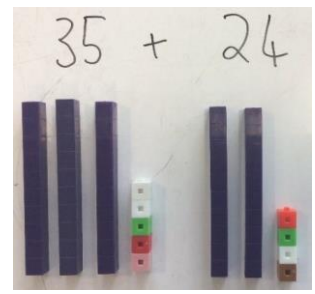


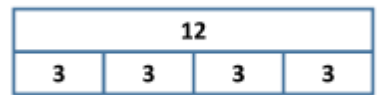
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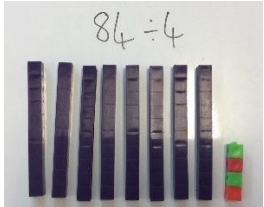
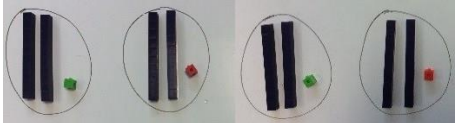




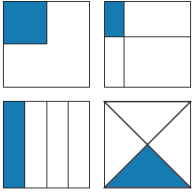

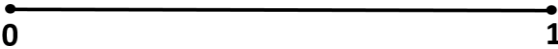



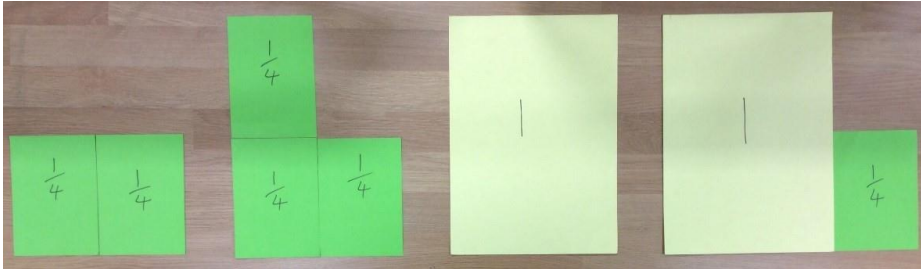
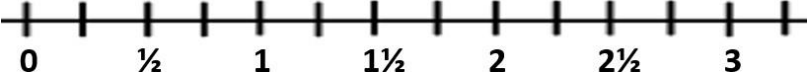


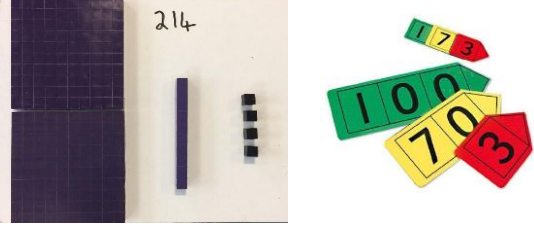

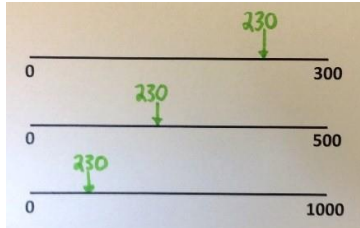
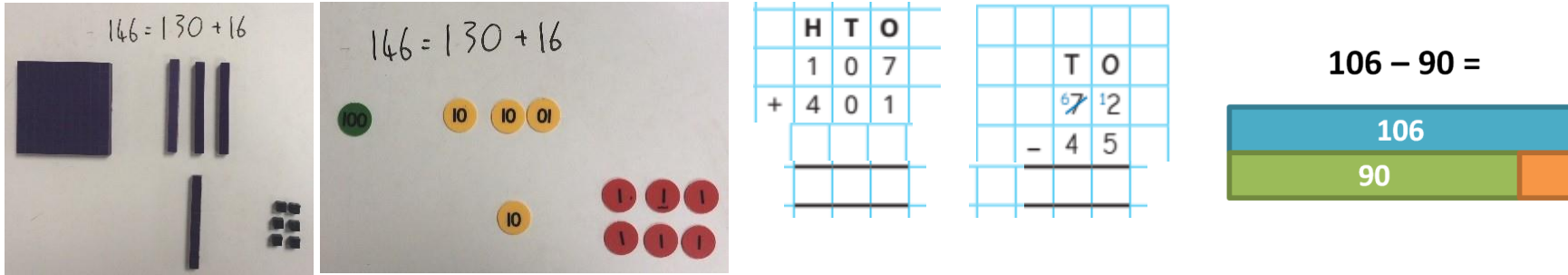
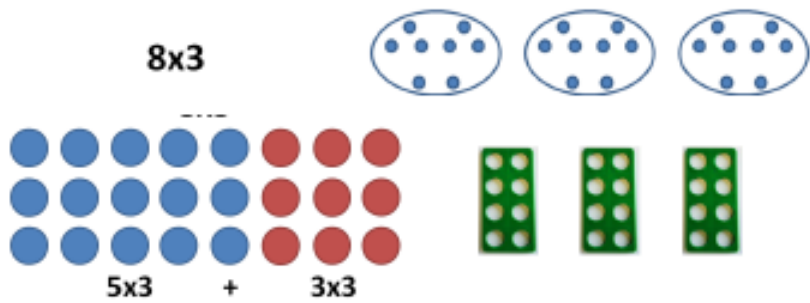

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<p>Secure knowledge of numbers as quantities</p>	<p>Children instantly subitize 1-3 items through dot pattern games and everyday experiences. Items may be unrelated.</p>  <p><i>Image shown briefly. How many toys?</i></p>	<p>A range of representations used for quantities 1-10. Children show numbers in different ways on fingers; games used to improve finger discrimination. Quick recognition of regular and irregular dot patterns, with larger quantities visualised in two parts (e.g. see 5 as 3 and 2). Children are taught to recognise quantities on 10-frame and base-5 number track.</p>  <p><i>'Circle 7 on the number track'</i></p>																																																																																																				
<p>To recite forwards and backwards number word sequences</p>	<p>Forwards and backwards number word sequences supported using songs and rhymes. Children continue number sequences starting from different numbers with some prior words in appropriate range e.g. 3, 4, 5, 6... or 24, 23... The transition over 10s boundaries supported by visuals. Number tracks used, with numbers hidden to add challenge as appropriate.</p> 																																																																																																					
<p>Add and subtract single-digit numbers</p>	<p>Addition built on experience of counting two groups. Opportunities provided for comparing quantities, using language more/less. Combining quantities in 10-frames and using Numicon encourage non-counting-in-ones strategies. Arrangement of sets counted also encourage counting on and calculation strategies.</p>  <p><i>Representation of 4+3 encourages counting on from 4</i></p> <p><i>Representation of 4+3 to help visualise 3+3+1</i></p>																																																																																																					
<p>Develop pre-multiplication and division concepts</p>	<p>Halves and doubles identified in a range of contexts, with a focus on equal halves. Shown on 10-frames and with Numicon.</p> 	<p>Counting in 2s supported by colouring of 100-square</p> <table border="1" data-bbox="963 1220 1288 1460"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table> <p>Opportunities for 'repeat add' counting in context e.g. counting socks. Repeated addition shown with dice patterns. Grouping and sharing context tasks provided.</p>  <p>5 people in each tent</p>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Objective	Visual representations			
<p>Know 1 more/less in the range 1-100, focusing on bordering tens boundaries</p>	<p>Identify and show one more/less in different ways. game: one more/less bingo.</p> 	<p>Find missing numbers on number track, focusing on tens boundaries.</p> 	<p>Beads to show quantities 1-100 (iPad Example app 'Number Rack').</p> 	
<p>With visuals, discern teens from tens</p>	<p>Organise large quantities in groups of 10 e.g. with egg boxes or pipe cleaners.</p> 	<p>Use teens/tens matching cards.</p> 	<p>Identify and make 2-digit numbers with dienes, showing in different ways.</p> 	<p>Partition 2-digits numbers using place-value cards</p> <p>Is it 34?</p> 
<p>Able to represent 1-10 in a range of ways, working out small quantities without counting all items</p>	<p>Immediate recognition of Numicon, 10-frame images, tally charts, dot patterns and finger patterns.</p> 	<p>Represent numbers on fingers in different ways.</p> 	<p>Estimate position of numbers on blank number lines with different start/end numbers.</p> 	
<p>Break down 1-10 in all possible ways, write number sentences using +, - and =</p>	<p>Subitizing games for regular and irregular dot patterns, with children visualising quantities in two parts.</p> 	<p>Arrangement of 2 colours of items e.g. in egg box</p> 	<p>Introduction of part-whole model from individuals squares/items to bars.</p> 	

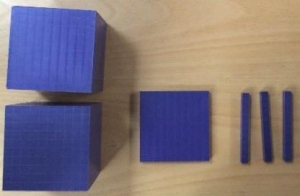
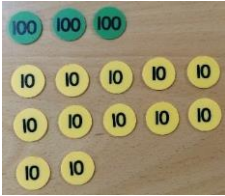
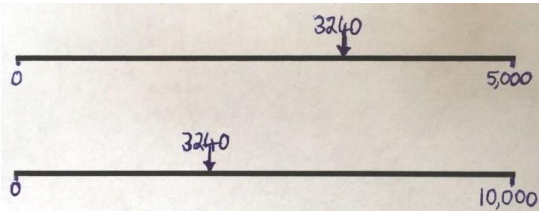

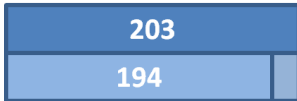
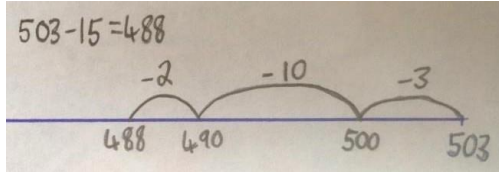
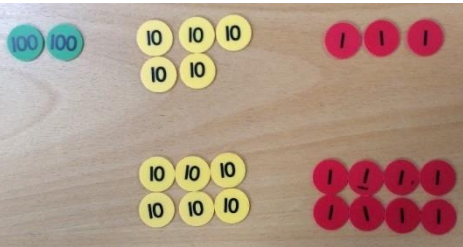
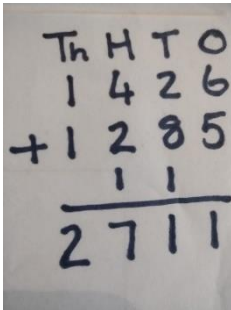
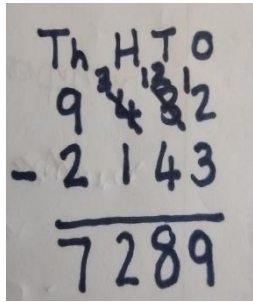
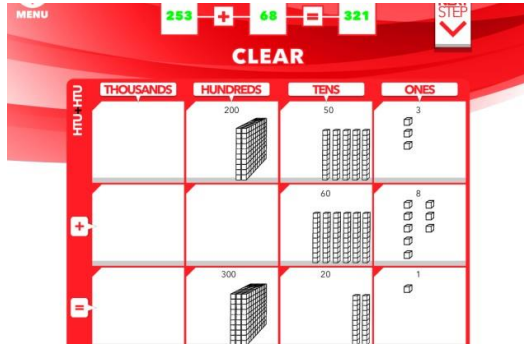



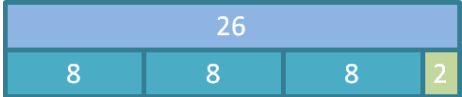
<p>Objective</p> <p>Represent and use number bonds and related subtraction facts within 20</p>	<p>Visual representations</p> <p>10-frames and 2-colour number tracks show calculations bordering 10: 'how many to 10, how many more?' Lead to use of blank number line.</p> <p>$7 + 5$</p> <p>$9 + 6 = \square$</p> <p>$11 - 3 = \square$</p> <p>Equivalence shown with balance scales and dice patterns.</p> <p>$5 = 3 + 2$</p> <p>Bar models used to show relationship between addition and subtraction.</p> <p>$\square = 8 + 3$</p> <p>$14 - 6 = \square$</p>
<p>Count in multiples of 2, 5 and 10</p>	<p>100-square with columns highlighted used to support counting. Counting beads used to visualise quantity when counting.</p> <p>Count in visual then hidden groups of 2, 5 and 10.</p>
<p>Recognise and make one-half in a range of ways (discern examples from non-examples); identify one-quarter</p>	<p>Half of a shape/capacity, number of objects, 10-frame half/double, half of length, half of an amount of money.</p> <p>Colour half of each whole shape:</p> <p>Circle half of this group of strawberries.</p> <p>What is half of this amount?</p>
<p>Link the value of coins to a matching visual</p>	<p>Match value of coins to Numicon pieces, use Numicon to support calculations involving money.</p>

Objective	Visual representations			
<p>Represent numbers 1-100 in a range of ways, showing understanding of placevalue</p>	<p>Represent tens/teens using dienes, numbers in different ways.</p> 	<p>Partition 2-digits numbers using place-value cards.</p> 	<p>Estimate position of numbers on blank number lines with different start/end.</p> 	<p>Find missing numbers on 100-square.</p>
<p>Use different calculation strategies for adding and subtracting one and two-digit numbers</p>	<p>Calculation within 30 using 10-frames, lead to use of number line, e.g. use egg-box 10-frames and app 'I See Addition and Subtraction'.</p>  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 10 \\ 24 \\ + 17 \\ \hline 41 \end{array}$ </div> <div style="text-align: center;"> <p>Children begin to use column method first without exchanges, then with.</p> </div> <div style="border: 1px solid black; padding: 5px;"> $\begin{array}{r} 10 \\ 673 \\ - 44 \\ \hline 29 \end{array}$ </div> </div>	<p>Model calculation using partitioning with dienes.</p> 	<p>Bar modelling to show relationship between + and - (using words 'whole/parts'). Include spatial reasoning estimates.</p>	
<p>Understand x as repeated adding, find related x and ÷ facts from a number sentence</p>	<p>Numicon and images of repeated quantities show multiplication as repeated addition.</p> 	<p>Arrays show commutativity of multiplication. Columns/rows circled to link to division.</p> 	<p>Bar model shows relationship between whole/parts and makes links to division.</p> 	




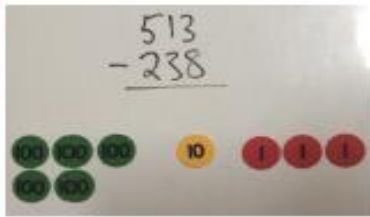
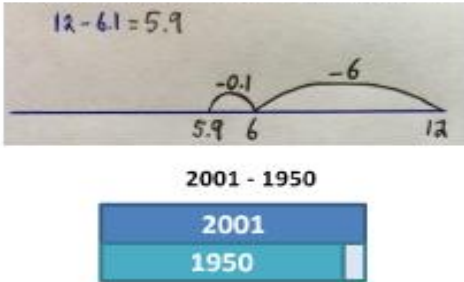
Objective	Visual representations		
<p>Use sharing and grouping strategies for division, re-relate division to finding unit fractions of quantities</p>	<p>Sharing supported by appropriate visuals, used where a large total is shared into few groups:</p>  	<p>Grouping strategy modelled with covered arrays and Numicon: how many [divisors] in [dividend]?</p>  <p>$20 \div 5 = 4$</p>  <p>20 dots. How many rows?</p> 	<p>Grouping context questions with supporting visuals.</p> <p>How many cars are needed to take 18 children to the match? 4 children per car.</p> 
<p>Represent fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ in a range of ways; order and recognise equivalence.</p>	<p>Fractions of areas/objects (and non-examples):</p> <p>Which of these diagrams are $\frac{1}{4}$ blue?</p>   <p><i>Include fractions of containers</i></p>	<p>Fractions of a length/number line:</p> <p>Estimate the position of $\frac{1}{4}$, $\frac{1}{3}$ and $\frac{3}{4}$</p>   	<p>Fractions of quantity:</p> <p>The children can have $\frac{3}{4}$ of the cupcakes.</p> 
<p>Use halves and quarters as counting numbers, going over 1</p>	<p>Modelled with fraction cards and on a number line.</p>  		

Objective	Visual representations		
<p>Represent 3-digit numbers in a range of ways, showing an understanding of place value</p>	<p>Make 3-digit numbers using dienes and place value cards, showing how they can be partitioned.</p> 	<p>Make the same number in different ways with place value coins.</p> 	<p>Estimate position of numbers on blank number lines with different start/end numbers.</p> 
<p>Add and subtract ones, tens and hundreds to HTU, making realistic estimates</p>	<p>Dienes and/or place value coins model written addition and subtraction. Written methods as Year 4 but HTU only. Bar model shows subtraction as difference.</p> 		
<p>Understand the inverse relationship between \times and \div; know \times as repeated adding, use to derive related multiplication facts.</p>	<p>A range of images show multiplication as repeated addition. 2-colour arrays show distributive law.</p>  <p>Bar model shows link between multiplication and division, and model division as sharing and grouping.</p> 		

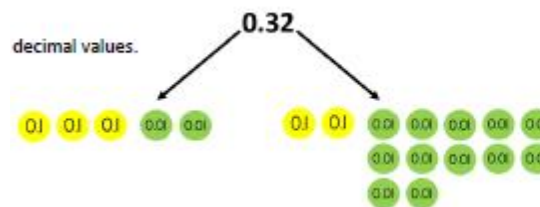
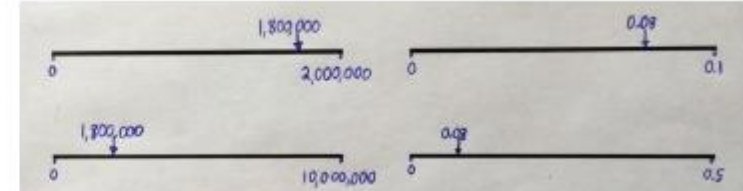
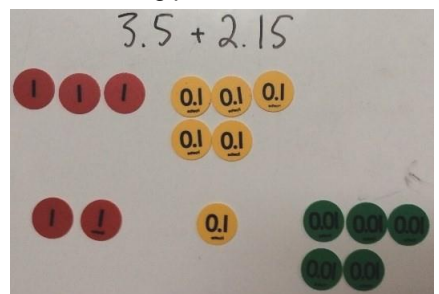
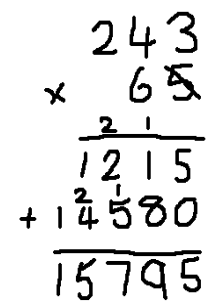
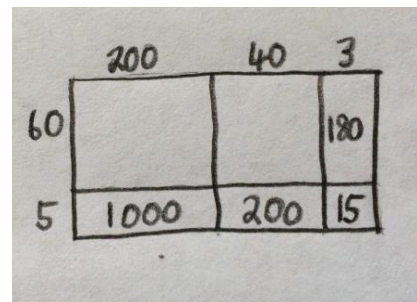
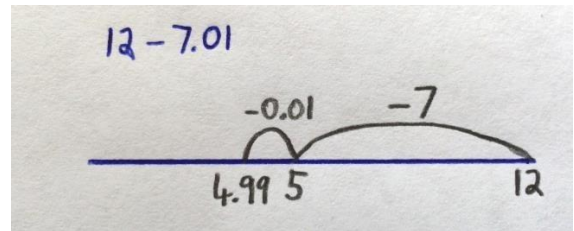
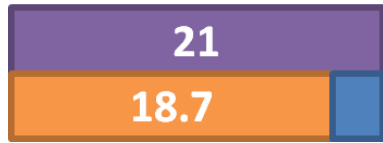
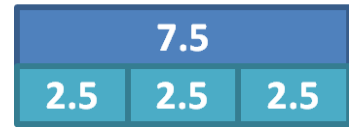
Objective	Visual representations
<p>Use efficient formal written methods for multiplication and division</p>	<p>Multiplication modelled using place value coins, leading to efficient written forms: These may be taught or modelled side-by-side.</p> <p style="text-align: center;">24×6</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div> <p>The concept of 'How many [divisors] in [dividend]' shown using Numicon, part-hidden arrays and by making shapes with matchsticks. $20 \div 3$ (how many 3s in 20?) and $20 \div 5$ (how many 5s in 20?):</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>
<p>Simple unit/non-unit fractions represented in a range of ways; different fractions compared including equivalence</p>	<p>Identify fraction of shaded shape; position fractions on a number line; use fraction cards to show equivalence and compare fractions.</p> <p style="text-align: center;">True or false?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>$\frac{1}{2}$</p> </div> <div style="text-align: center;"> <p>$\frac{1}{3}$</p> </div> <div style="text-align: center;"> <p>$\frac{1}{2}$</p> </div> </div> <p style="text-align: center;">Estimate the position of $\frac{1}{3}$, $\frac{1}{5}$ and $\frac{7}{10}$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> </div>
<p>Use quarters, halves and tenths as counting numbers going over 1</p>	<p>Modelled with fraction cards and on number lines.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>

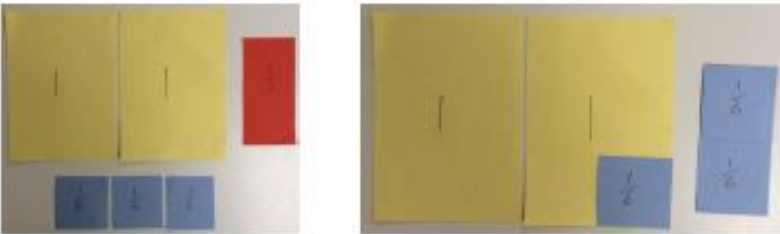

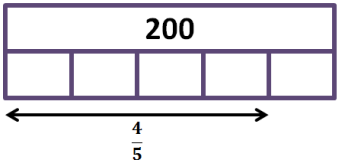
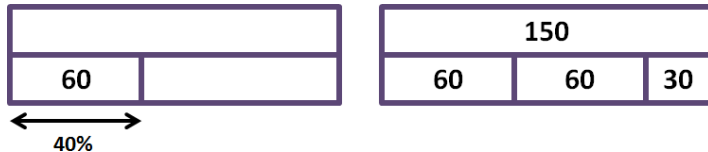

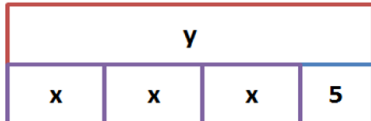
Objective	Visual representations	
<p>Represent 4-digit numbers in a range of ways, showing understanding of place value</p>	<p>Make 4-digit numbers using dienes and place value coins, building numbers in different ways.</p> <p>2,130</p>  <p>420 with three 100s and twelve 10s</p> 	<p>Estimate the position of numbers on blank number lines with different start/end numbers.</p> 
<p>Choose efficient mental strategies for adding and subtracting numbers</p>	<p>Round and adjust to calculate, model with appropriate visual</p> <p>350-198 modelled with place value counters: take away 200, add 2.</p>  <p>203 - 194</p> 	<p>Choose whether to count on or count back, show with number line or bar model.</p> <p>503-15=488</p> 
<p>Become fluent in written methods for addition and subtraction</p>	<p>Model vertical methods for addition and subtraction step-by-step using place value counters or Base 10. Moving to column methods.</p> <p>253 + 68</p>   	
<p>Understand and represent multiplication and division in a range of ways; derive related facts from a given calculation.</p>	<p>Use arrays and bar models to derive related multiplication and division facts</p> <p>Understand division as 'how many [divisors] in [dividend]' showing remainders using matchsticks to make shapes and bar models.</p> <p>This image shows 4 x 6</p>  <p>Change the image to show 4 x 7</p> <p>This image shows 4 x 6</p>  <p>Use the image to calculate 4 x 12</p> <p>17 ÷ 3</p>  	

Objective	Visual Representations																														
<p>Use efficient formal written methods for multiplication and division of 3-digit numbers</p>	<p>Division modelled with place value counters.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> $92 \div 4$ $4 \overline{)92}$ </div> <div style="text-align: center;"> $92 \div 4$ $4 \overline{)92}$ </div> <div style="text-align: center;"> $92 \div 4$ $4 \overline{)92}$ </div> <div style="text-align: center;"> $92 \div 4$ $4 \overline{)92}$ </div> </div> <p>Children build up to using the short written multiplication method.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td>200</td><td>60</td><td>4</td></tr> <tr><td>8</td><td>1600</td><td>480</td><td>32</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>H</td><td>T</td><td>O</td></tr> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>×</td><td></td><td>4</td></tr> <tr><td></td><td>1</td><td>2</td> <small>(3 × 4)</small></tr> <tr><td></td><td>8</td><td>0</td> <small>(20 × 4)</small></tr> <tr><td>+</td><td>4</td><td>0</td> <small>(100 × 4)</small></tr> <tr><td></td><td>4</td><td>9</td><td>2</td></tr> </table> <div style="text-align: right;"> $\begin{array}{r} 264 \\ \times \quad 8 \\ \hline 53 \\ \hline 2112 \end{array}$ </div> </div>		200	60	4	8	1600	480	32	H	T	O	1	2	3	×		4		1	2		8	0	+	4	0		4	9	2
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<p>Find equivalent fractions, calculate fractions of amounts (unit and non-unit fractions)</p>	<p>Fraction cards and Lego used to show equivalence.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> </div> <p>Fractions of quantities shown using place value counters and bar models, presented in stages.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $180 \div 3 = 60$ </div> <div style="text-align: center;"> $\frac{3}{4}$ of 60 </div> </div>																														
<p>Know decimal equivalents for quarters and halves, relating to division</p>	<p>Dividing length of a metre ruler into two/four equal parts.</p>																														

Objective	Visual representations																																																						
<p>Represent the value of digits in numbers of up to 7-digits and decimals to thousandths</p>	<p>Make numbers in the range using place value coins, partitioning decimal values and showing the same number in different ways.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>0.35</p>  </div> <div style="text-align: center;"> <p>430</p>  </div> </div>																																																						
<p>Choose efficient strategies and apply knowledge of place value when adding and subtracting</p>	<p>Model vertical methods for addition and subtraction step-by-step using Base 10 or place value counters.</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div>																																																						
<p>Develop a range of strategies for multiplication including efficient written methods</p>	<p>Compact written method made visual by area model.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Handwritten compact multiplication:</p> $\begin{array}{r} 243 \\ \times 65 \\ \hline 1215 \\ + 14580 \\ \hline 15795 \end{array}$ </div> <div style="text-align: center;"> <p>Area model for 243 x 65:</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>200</td> <td>40</td> <td>3</td> <td></td> </tr> <tr> <td>60</td> <td></td> <td></td> <td>180</td> <td></td> </tr> <tr> <td>5</td> <td>1000</td> <td>200</td> <td>15</td> <td></td> </tr> </table> </div> <div style="text-align: center;"> <p>Area models for 16 x 9:</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>10</td> <td>6</td> <td></td> </tr> <tr> <td>9</td> <td>90</td> <td>54</td> <td></td> </tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>8</td> <td>8</td> <td></td> </tr> <tr> <td>9</td> <td>72</td> <td>72</td> <td></td> </tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td colspan="2">16</td> <td></td> </tr> <tr> <td>5</td> <td colspan="2">80</td> <td></td> </tr> <tr> <td>4</td> <td colspan="2">64</td> <td></td> </tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> <tr> <td>9</td> <td>36</td> <td>36</td> <td>36</td> <td>36</td> </tr> </table> </div> </div> <p>Area model used to show multiplication where numbers are partitioned in different ways.</p>			200	40	3		60			180		5	1000	200	15			10	6		9	90	54			8	8		9	72	72			16			5	80			4	64				4	4	4	4	9	36	36	36	36
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Objective	Visual representations
<p>Develop a range of strategies for division including efficient written methods</p>	<p>Division modelled with place value counters.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> $641 \div 3$ $\begin{array}{r} 3 \overline{) 641} \\ \underline{6} \\ 0 \\ \underline{0} \\ 0 \end{array}$ <div style="display: flex; justify-content: space-around; width: 100px;"> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> </div> <div style="text-align: center;"> $641 \div 3$ $\begin{array}{r} 2 \\ 3 \overline{) 641} \\ \underline{6} \\ 0 \\ \underline{0} \\ 0 \end{array}$ <div style="display: flex; justify-content: space-around; width: 100px;"> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 100 </div> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 100 </div> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 100 </div> </div> </div> <div style="text-align: center;"> $641 \div 3$ $\begin{array}{r} 21 \\ 3 \overline{) 641} \\ \underline{6} \\ 0 \\ \underline{0} \\ 0 \end{array}$ <div style="display: flex; justify-content: space-around; width: 100px;"> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 10 </div> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 10 </div> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 10 </div> </div> </div> <div style="text-align: center;"> $641 \div 3$ $\begin{array}{r} 213r2 \\ 3 \overline{) 641} \\ \underline{6} \\ 0 \\ \underline{0} \\ 0 \end{array}$ <div style="display: flex; justify-content: space-around; width: 100px;"> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 10 10 </div> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 10 10 </div> <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; flex-direction: column; align-items: center;"> 100 10 10 </div> </div> </div> </div> <p>Bar model used to reinforce 'how many [divisors] in [dividend]?'</p> <div style="text-align: center;"> $750 \div 150$ </div>
<p>Compare and order fractions, find equivalent fractions, add and subtract fractions.</p>	<p>Fraction cards used to compare, show equivalence and model calculations.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div> <p><i>Example: $\frac{3}{4} + \frac{1}{2}$</i></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>
<p>Find decimal equivalents for quarters, fifths and tenths, relating to division</p>	<p>Dividing length of a metre ruler into two/four/five equal parts.</p>

Objective	Visual representations
<p>Represent numbers of up to 8-digits and decimals to thousandths in a range of ways</p>	<p>Make numbers in a range of ways using place value coins, partitioning decimal values.</p> <p>Estimate the position of numbers on blank number lines with different start/end numbers.</p>  
<p>Carry out formal written methods of calculation for all four operations</p>	<p>Place value of numbers in addition and subtraction modelled using place value counters.</p> <p>Multiplication visualised using area model.</p>   
<p>Choose efficient strategies and apply flexible knowledge of number to calculate</p>	<p>Choose appropriate visuals to model structure of calculations, including modelling worded questions.</p>   

Objective (Y6)	Visual representations
<p>Add and subtract fractions with different denominators</p>	<p>Fraction cards to show conversion into common denominators and calculating over whole-number boundaries. Example: $2\frac{1}{3} - \frac{3}{6}$</p> 
<p>Multiply and divide unit fractions and simple non-unit fractions</p>	<p>Area model diagrams to model a fraction being divided or multiplied by a fraction (modelled in two steps).</p> 
<p>Calculate percentages and fractions of quantities</p>	<p>Bar model visualises finding fraction/percentage of quantity and finding the whole given a percentage/fraction. Shown step-by-step.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>$\frac{4}{5} \times 200$</p>  </div> <div style="text-align: center;"> <p>40% of a number is 60. What's the number?</p>  </div> </div>
<p>Describe linear number sequences, including using formulae in the form $y = mx + c$</p>	<p>Numicon and bar model used to model linear number sequences or equations.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1, 4, 7, 10</p>  </div> <div style="text-align: center;"> <p>$y = 3x + 5$</p>  </div> </div>