



St Mary's Primary School

KS1 Calculation Policy

Autumn 2023

The following pages show the progression in calculation (addition, subtraction, multiplication and division) and how this works in line with the National Curriculum.

The consistent use of the CPA (concrete, pictorial, abstract) approach helps children develop mastery across all the operations in an efficient and reliable way.

This policy shows how these methods develop children's confidence in their understanding of both written and mental methods.

KEY STAGE 1

Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition and subtraction.


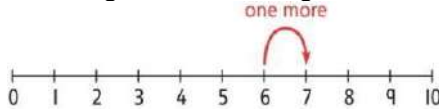
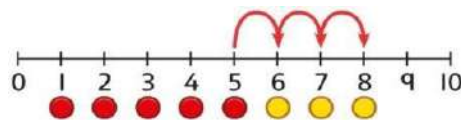
Key Vocabulary: whole, part, ones, ten, tens, number bond, add, addition, plus, total, altogether, subtract, subtraction, find the difference, take away, minus, less, more, group, share, equal, equals, is equal to, groups, equal groups, times, multiply, multiplied by, divide, share, shared equally, times-table

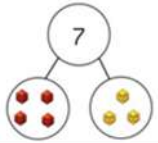
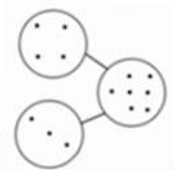
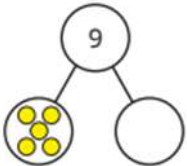
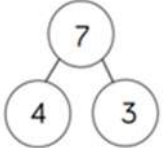
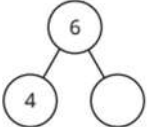
Addition and subtraction: Children first learn to connect addition and subtraction with counting, but they soon develop two very important skills: an understanding of parts and wholes, and an understanding of unitising 10s, to develop efficient and effective calculation strategies based on known number bonds and an increasing awareness of place value.

Addition and subtraction are taught in a way that is interlinked to highlight the link between the two operations. A key idea is that children will select methods and approaches based on their number sense. For example, in Year 1, when faced with $15 - 3$ and $15 - 13$, they will adapt their ways of approaching the calculation appropriately. The teaching should always emphasise the importance of mathematical thinking to ensure accuracy and flexibility of approach, and the importance of using known number facts to harness their recall of bonds within 20 to support both addition and subtraction methods.

Multiplication and division: Children develop an awareness of equal groups and link this with counting in equal steps, starting with 2s, 5s and 10s. In Year 2, they learn to connect the language of equal groups with the mathematical symbols for multiplication and division. They learn how multiplication and division can be related to repeated addition and repeated subtraction to find the answer to the calculation. In this key stage, it is vital that children explore and experience a variety of strong images and manipulative representations of equal groups, including concrete experiences as well as abstract calculations. Children begin to recall some key multiplication facts, including doubles, and an understanding of the 2, 5 and 10 times-tables and how they are related to counting.

Year 1

Year 1			
	Concrete	Pictorial	Abstract
Addition	<p>Counting on and adding more.</p> <p>Children add one more person or object to a group to find one more.</p>	<p>Counting on and adding more.</p> <p>Children add one more cube or counter to a group to represent one more.</p>  <p><i>One more than 4 is 5.</i></p>	<p>Counting on and adding more.</p> <p>Use a number line to understand how to link counting on with finding one more.</p>  <p><i>One more than 6 is 7. 7 is one more than 6.</i></p> <p>Learn to link counting on with adding more than one.</p>  <p>$5 + 3 = 8$</p>

	<p>The part whole model</p> <p>Children to use counters/ cubes to represent numbers.</p> 	<p>The part whole model</p> <p>Use dots/ circles in the part whole model to represent the numbers.</p>  <p><u>Find a part</u></p>  $\begin{array}{l} \underline{\quad} + \underline{\quad} = \underline{\quad} \\ \underline{\quad} = \underline{\quad} + \underline{\quad} \end{array}$	<p>The part whole model</p> <p>The numbers are represented by the part whole model.</p>  <p><u>Find a part</u></p>  $4 + \underline{\quad} = 6$
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	<p>Knowing and finding number bonds within 10. Break apart a group and put back together to find and form number bonds.</p>	<p>Knowing and finding number bonds within 10.</p>	<p>Knowing and finding number bonds within 10.</p>
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$3 + 4 = 7$



$6 = 2 + 4$

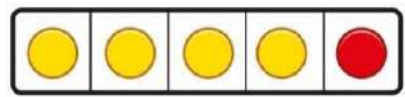


Use different coloured cubes/ counters to find number bonds within ten.

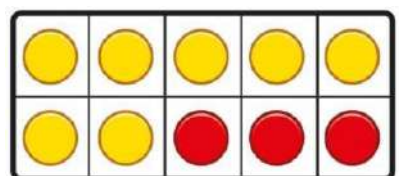


Use five and ten frames to represent key number bonds.

$4 + 1 = 5$

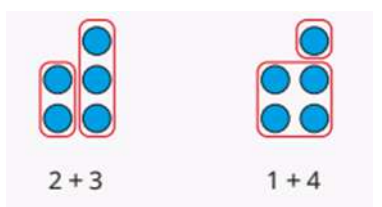


$5 = 4 + 1$



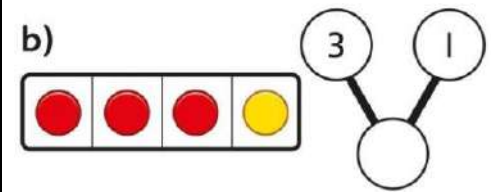
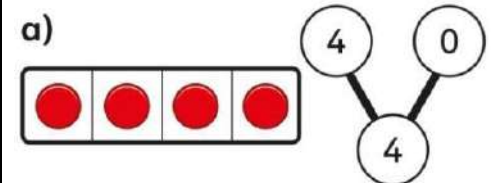
How many more counters do you need to make 10?

$10 = 7 + 3$



Show children different arrangements of circles to see what number sentences they can see.

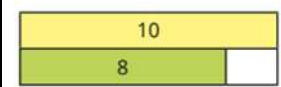
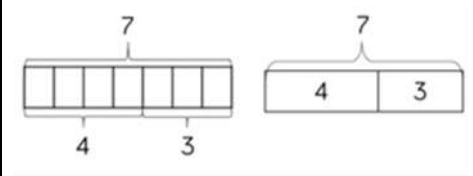
Use a part-whole model alongside other representations to find number bonds. Make sure to include examples where one of the parts is zero.



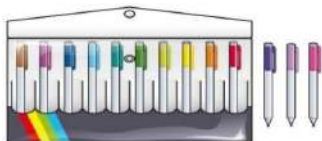
$4 + 0 = 4$

$3 + 1 = 4$

Using bar models to represent number bonds to 10.



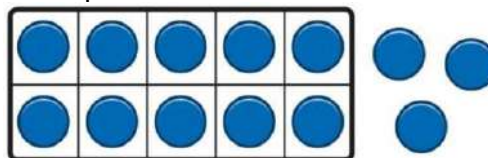
Understanding teen numbers as a complete ten and some more.



Complete a group of 10 objects and count more.
13 is ten and 3 more

Understanding teen numbers as a complete ten and some more.

Use a ten frame to support understanding of a complete 10 for teen numbers.



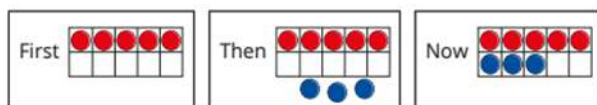
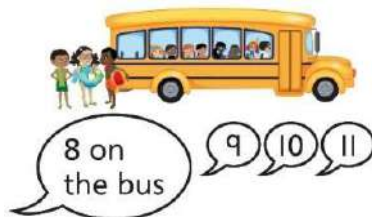
13 is 10 and 3 more.

Understanding teen numbers as a complete ten and some more.

1 ten and 3 ones equal 13. $10 + 3 = 13$

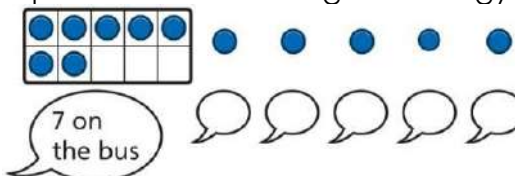
Add by counting on.

Children use knowledge of counting to 20 to find a total by counting on using people or objects.

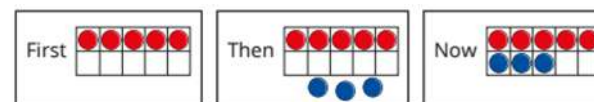


Add by counting on.

Children use counters to support and represent their counting on strategy.

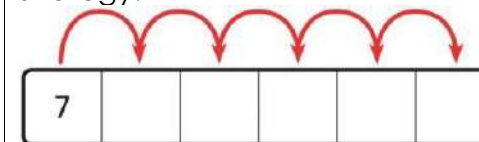


Draw/ fill representations to show adding on. Use varied representations.



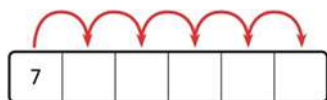
Add by counting on.

Children use number lines or number tracks to support their counting on strategy.



$7 + 5 = \square$





$$7 + 5 = \square$$



Physically use counters to support adding on.

Adding the 1s

Children use bead strings to recognise how to add the 1s to find the total efficiently.



$$2 + 3 = 5$$

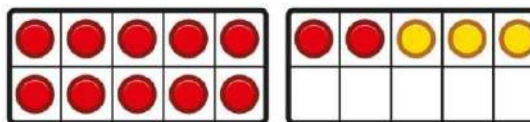
$$12 + 3 = 15$$



Use base ten to use number bonds and related facts when adding within 20.

Adding the 1s

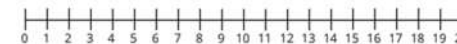
Children represent calculations using ten frames to add a teen and 1s.



$$2 + 3 = 5$$

$$12 + 3 = 15$$

Use the number line to count on. This builds on the use of number tracks.




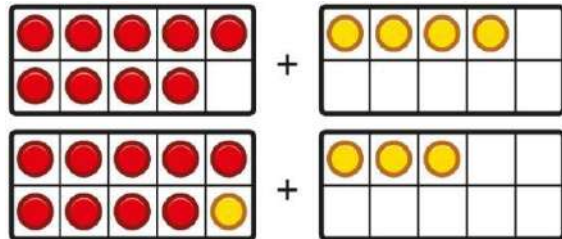
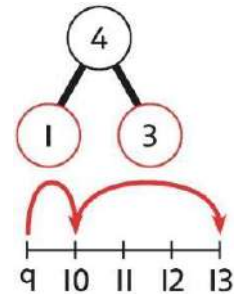
$$9 + 6 = \underline{\quad}$$

Adding the 1s

Children recognise that a teen is made from a 10 and some 1s and use their knowledge of addition within 10 to work efficiently.


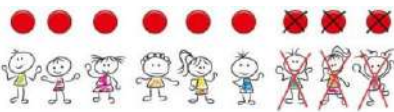
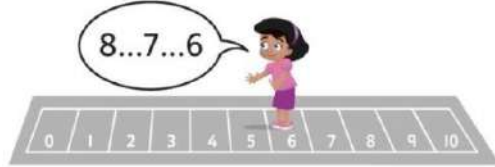
$$3 + 5 = 8$$

$$\text{So, } 13 + 5 = 18$$

	<p>Bridging the 10 using number bonds Children use a bead string to complete a 10 and understand how this relates to the addition.</p>  <p>7 add 3 makes 10. So, 7 add 5 is 10 and 2 more.</p>	<p>Bridging the 10 using number bonds Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10.</p> 	<p>Bridging the 10 using number bonds Use a part-whole model and a number line to support the calculation.</p>  <p>$9 + 4 = 13$</p>
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Subtraction

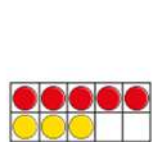
Subtraction	Concrete	Pictorial	Abstract
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	<p>Counting back and taking away. Children arrange objects and remove to find how many are left.</p>  <p>1 less than 6 is 5.</p>	<p>Children draw and cross out or use counters to represent objects from a problem.</p>  <p>$9 - \square = \square$ There are <input type="text"/> children left.</p>	<p>Children count back to take away and use a number line or number track to support the method.</p>  <p>$9 - 3 = 6$</p>
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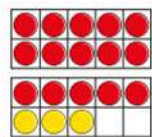
6 subtract 1 is 5.



Subtract using number bonds.



$8 - 3 = \underline{\quad}$



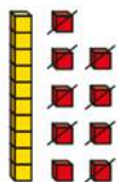
$18 - 3 = \underline{\quad}$

Building

representations using counters and tens frames. Use base 10 to also demonstrate this.

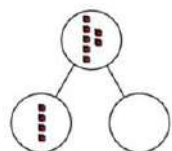


9-8

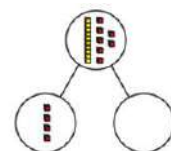


19-8

Subtract using number bonds. Represent the numbers using a part whole model.



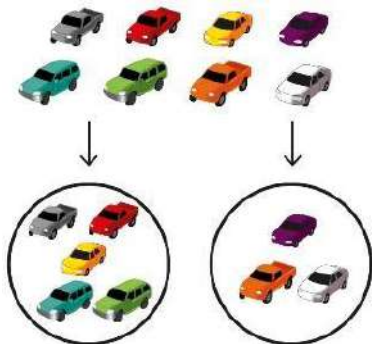
7- 4



17-4

Finding a missing part, given a whole and a part

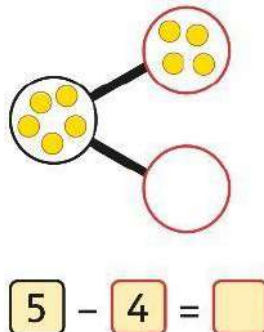
Children separate a whole into parts and understand how one part can be found by subtraction.



$8 - 5 = ?$

Finding a missing part, given a whole and a part

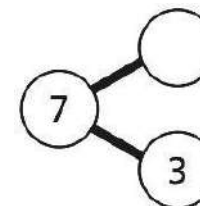
Children represent a whole and a part and understand how to find the missing part by subtraction.



$5 - 4 = \square$

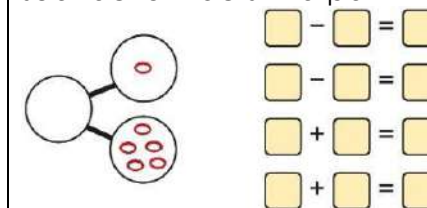
Finding a missing part, given a whole and a part

Children use a part-whole model to support the subtraction to find a missing part.



$7 - 3 = ?$

Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.

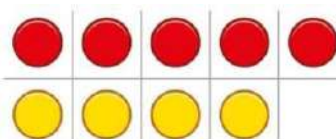


Finding the difference

Arrange two groups so that the difference between the groups can be worked out. Use counters/ cubes to find the difference.

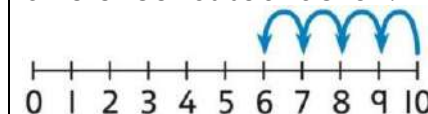
Finding the difference

Represent objects using sketches or counters to support finding the difference.


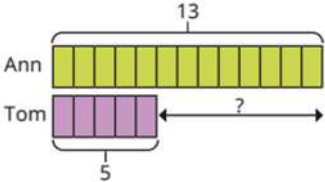

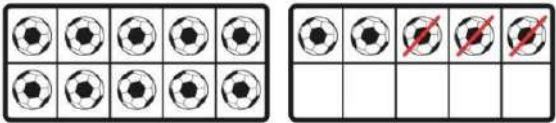




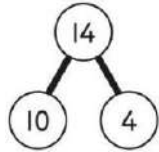
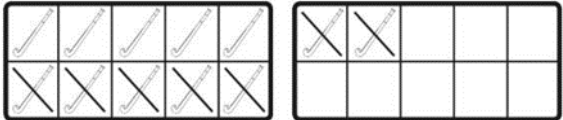
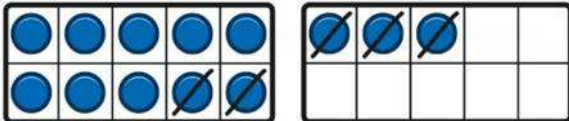
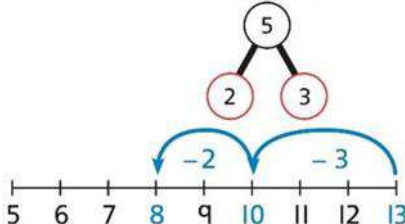
Finding the difference

Children understand 'find the difference' as subtraction.



$10 - 4 = 6$

	 <p>8 is 2 more than 6. 6 is 2 less than 8. The difference between 8 and 6 is 2.</p>	<p>$5 - 4 = 1$ The difference between 5 and 4 is 1.</p>  <p>What is the difference between 13 and 5? How many more does Ann have than Tom? How many less than Ann has Tom got?</p>	<p>The difference between 10 and 6 is 4.</p>
	<p>Subtraction within 20 Understand when and how to subtract 1s efficiently.</p> <p>Use a bead string to subtract 1s efficiently.</p>  <p>$5 - 3 = 2$ $15 - 3 = 12$</p>	<p>Subtraction within 20 Understand when and how to subtract 1s efficiently.</p>  <p>$5 - 3 = 2$ $15 - 3 = 12$</p>	<p>Subtraction within 20 Understand how to use knowledge of bonds within 10 to subtract efficiently.</p> <p>$5 - 3 = 2$ $15 - 3 = 12$</p>





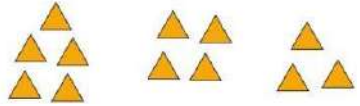

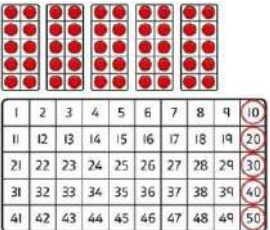
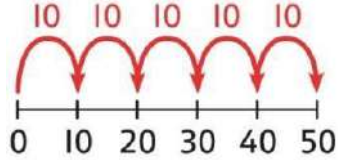
	<p>Subtracting 10s and 1s For example: $18 - 12$</p> <p>Subtract 12 by first subtracting the 10, then the remaining 2.</p>  <p><i>First subtract the 10, then take away 2.</i></p>	<p>Subtracting 10s and 1s For example: $18 - 12$</p> <p>Use ten frames to represent the efficient method of subtracting 12.</p>  <p><i>First subtract the 10, then subtract 2.</i></p>	<p>Subtracting 10s and 1s Use a part-whole model to support the calculation.</p>  <p>$19 - 14$ $19 - 10 = 9$ $9 - 4 = 5$ So, $19 - 14 = 5$</p>
	<p>Subtraction bridging 10 using number bonds For example: $12 - 7$</p> <p>Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts.</p>  <p><i>7 is 2 and 5, so I take away the 2 and then the 5.</i></p>	<p>Subtraction bridging 10 using number bonds Represent the use of bonds using ten frames.</p>  <p>For $13 - 5$, I take away 3 to make 10, then take away 2 to make 8.</p>	<p>Subtraction bridging 10 using number bonds Use a number line and a part-whole model to support the method. $13 - 5$</p> 


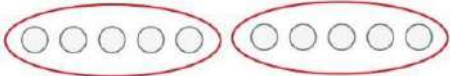
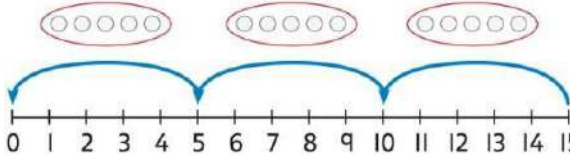
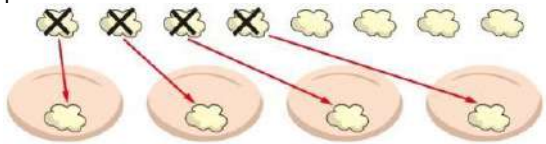
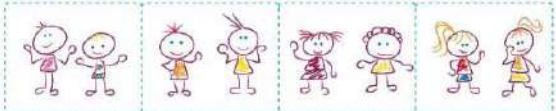
Multiplication

Concrete

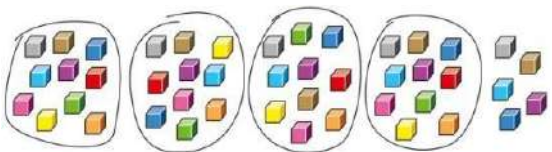

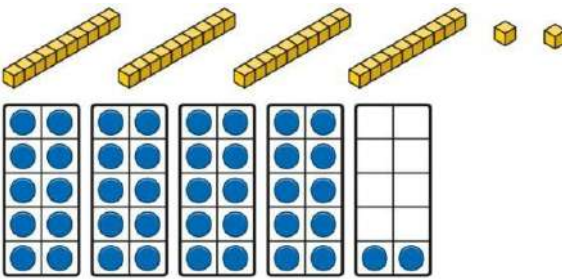
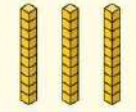

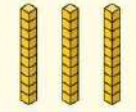

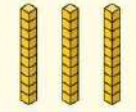

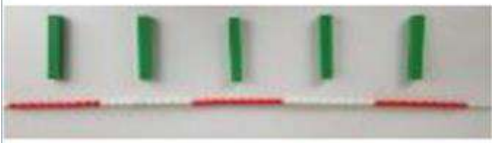
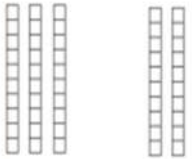
Pictorial

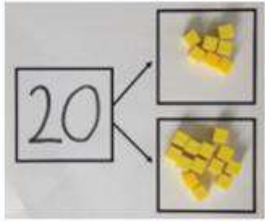
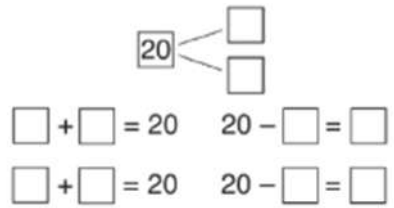

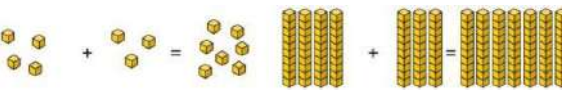
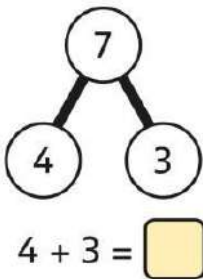
Abstract

	<p>Recognising and making equal groups Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal.</p> <p>A  B  C </p>	<p>Recognising and making equal groups Children draw and represent equal and unequal groups.</p> <p>A  B </p>	<p>Describe equal groups using words</p> <p>Three equal groups of 4. Four equal groups of 3.</p>
	<p>Finding the total of equal groups by counting in 2s, 5s and 10s</p>  <p>There are 5 pens in each pack ... 5...10...15...20...25...30...35...40...</p>	<p>Finding the total of equal groups by counting in 2s, 5s and 10s 100 squares and ten frames support counting in 2s, 5s and 10s.</p> 	<p>Finding the total of equal groups by counting in 2s, 5s and 10s Use a number line to support repeated addition through counting in 2s, 5s and 10s.</p> 
Division			
	Concrete	Pictorial	Abstract

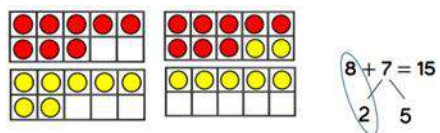
	<p>Grouping Learn to make equal groups from a whole and find how many equal groups of a certain size can be made.</p> <p>Sort a whole set people and objects into equal groups.</p>  <p><i>There are 10 children altogether. There are 2 in each group. There are 5 groups.</i></p>	<p>Grouping Represent a whole and work out how many equal groups.</p>  <p><i>There are 10 in total. There are 5 in each group. There are 2 groups.</i></p>	<p>Grouping Children may relate this to counting back in steps of 2, 5 or 10.</p> 
	<p>Sharing Share a set of objects into equal parts and work out how many are in each part.</p> 	<p>Sharing Sketch or draw to represent sharing into equal parts. This may be related to fractions.</p> 	<p>Sharing <i>10 shared into 2 equal groups gives 5 in each group.</i></p>

Year 2		
Addition		
Concrete	Pictorial	Abstract

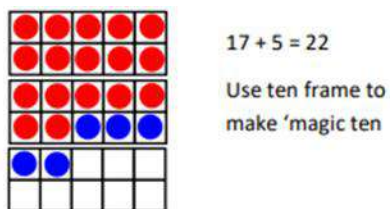
<p>Understanding 10s and 1s</p>	<p>Group objects into 10s and 1s.</p>  <p>Bundle straws to understand unitising of 10s.</p> 	<p>Understand 10s and 1s equipment, and link with visual representations on ten frames.</p> 	<p>Represent numbers on a place value grid, using equipment or numerals.</p> <table border="1" data-bbox="1568 231 1870 462"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td>3</td> <td>2</td> </tr> </tbody> </table> <table border="1" data-bbox="1568 470 1870 566"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>3</td> </tr> </tbody> </table>	Tens	Ones			3	2	Tens	Ones	4	3
Tens	Ones												
													
3	2												
Tens	Ones												
4	3												
<p>Adding multiples of ten.</p>	<p>$50 = 30 + 20$</p>  <p>Model using dienes and bead strings</p>	 <p>__ tens and __ tens makes __ tens</p> <p>Use representations for base ten.</p>	<p>$20 + 30 = 50$</p> <p>$70 = 50 + 20$</p> <p>$40 + \square = 60$</p> <p>$\square + 30 = 50$</p>										

<p>Using known facts – part whole.</p>	 <p>Children explore ways of making numbers within 20</p>		$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$
<p>Adding 10s</p>	<p>Use known bonds and unitising to add 10s.</p>  <p><i>I know that 4 + 3 = 7. So, I know that 4 tens add 3 tens is 7 tens.</i></p>	<p>Use known bonds and unitising to add 10s.</p>  <p><i>I know that 4 + 3 = 7. So, I know that 4 tens add 3 tens is 7 tens.</i></p>	<p>Use known bonds and unitising to add 10s.</p>  <p>$4 + 3 = 7$ $4 \text{ tens} + 3 \text{ tens} = 7 \text{ tens}$ $40 + 30 = 70$</p> <p>Use known bonds and unitising to add 10s.</p>

Add by making ten (1 digit and 2 digits)



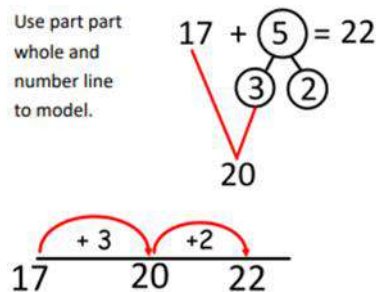
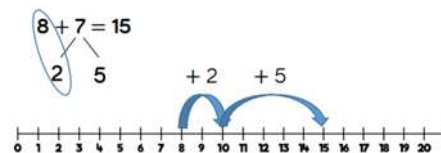
When adding one digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. Manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps.



Children explore the pattern.

$$17 + 5 = 22$$

$$27 + 5 = 32$$



Use part part whole and number line to model.

$$8 + 7 = 10 + 5 = 15$$

$$17 + 5 = 20 + 2 = 22$$

Adding a 1-digit number to a 2-digit number not bridging a 10

Add the 1s to find the total. Use known bonds within 10.



$41 + 5$

*41 is 4 tens and 1 one.
41 add 6 ones is 4 tens and 7 ones.*

This can also be done in a place value grid.

T	O

Add the 1s.

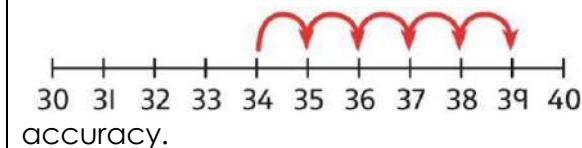


*34 is 3 tens and 4 ones.
4 ones and 5 ones are 9 ones.
The total is 3 tens and 9 ones.*

T	O

Add the 1s.

Understand the link between counting on and using known number facts. Children should be encouraged to use known number bonds to improve efficiency and accuracy.



This can be represented horizontally or vertically.

$34 + 5 = 39$

Adding a 1-digit number to a 2-digit number (adding across a ten)

When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

$45 + 7$

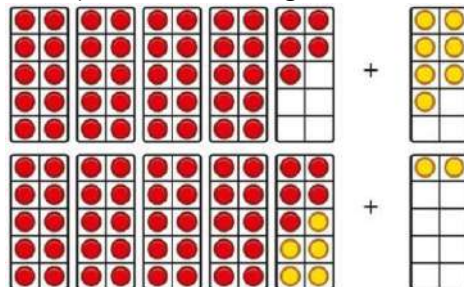
Complete a 10 using number bonds.



*There are 4 tens and 5 ones.
I need to add 7. I will use 5 to complete a 10, then add 2 more.*

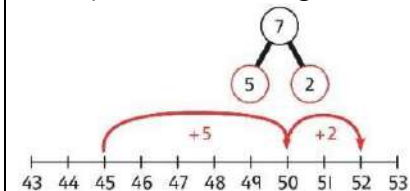
$45 + 7$

Complete a 10 using number bonds.



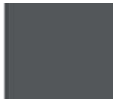
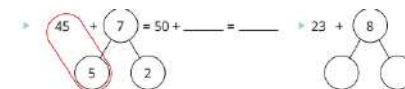
$45 + 7$

Complete a 10 using number bonds.



$7 = 5 + 2$

$45 + 5 + 2 = 52$



Adding a multiple of 10 to a 2-digit number

Add the 10s and then recombine.



27 is 2 tens and 7 ones.
50 is 5 tens.

There are 7 tens in total and 7 ones.
So, $27 + 50$ is 7 tens and 7 ones.



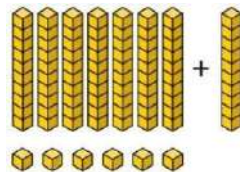
$25 + 10 = 35$

Explore that the ones digit does not change

T	O

16 is 1 ten and 6 ones.
30 is 3 tens.
There are 4 tens and 6 ones in total.

Add the 10s and then recombine.



66 is 6 tens and 6 ones.
 $66 + 10 = 76$

A 100 square can support this understanding.

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

T	O

16 is 1 ten and 6 ones.
30 is 3 tens.

Add the 10s and then recombine.

$37 + 20 = ?$

$30 + 20 = 50$
 $50 + 7 = 57$

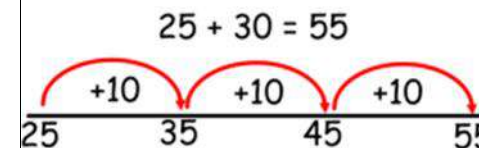
$37 + 20 = 57$

$27 + 10 = 37$

$27 + 20 = 47$

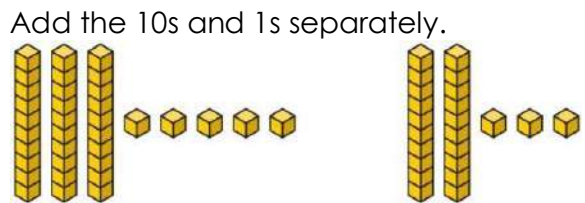
$27 + \square = 57$

$\square + 30 = 67$



		There are 4 tens and 6 ones in total.	
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Adding two 2-digit Numbers (not across ten)



$5 + 3 = 8$
There are 8 ones in total.

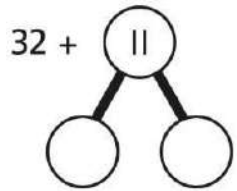
$3 + 2 = 5$
There are 5 tens in total.

$35 + 23 = 58$

	Tens	Ones
+		

	Tens	Ones
+		

Add the 10s and 1s separately. Use a part-whole model to support.



$11 = 10 + 1$
 $32 + 10 = 42$
 $42 + 1 = 43$

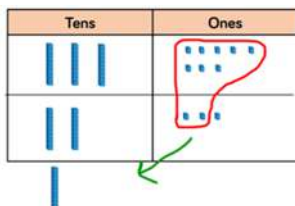
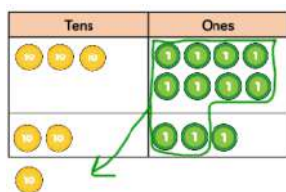
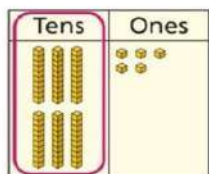
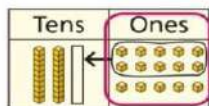
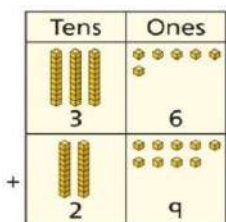
$32 + 11 = 43$

Add the tens and the ones separately.

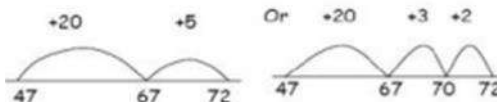
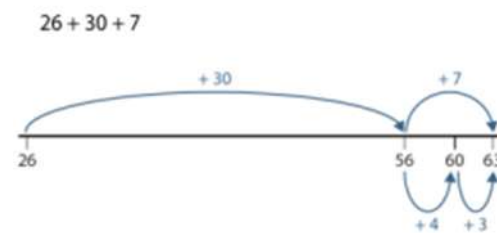
Add the ones first, then the tens to support column addition when this is taught.

Adding two 2-digit numbers with exchange

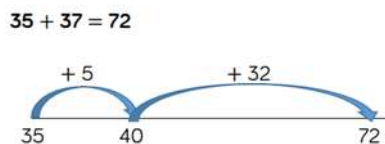
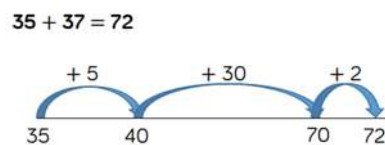
Add the 1s. Exchange 10 ones for a ten. Then add the 10s.



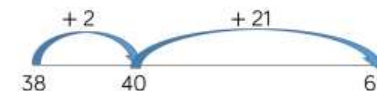
Draw representations.



Use number line and bridge ten using part whole if necessary.



Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.



$38 + 23$

$24 + 38 = \square$

$29 + \square = 51$

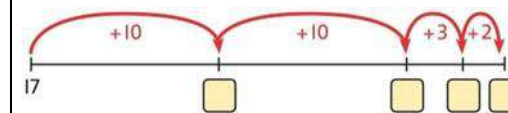
$38 + 24 = \square$

$\square + 22 = 51$

Number lines can be used to support the abstract.

$17 + 25 =$

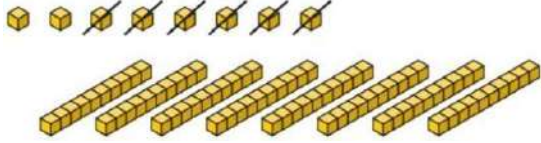
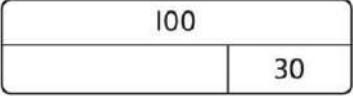
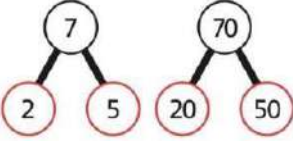
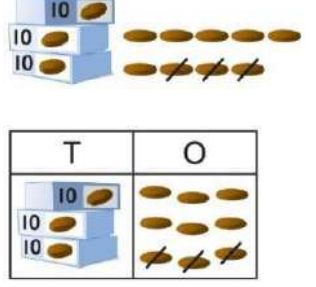
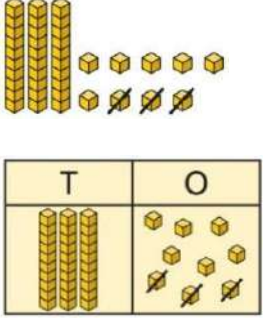

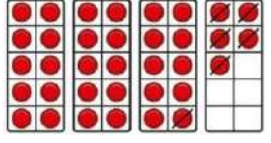
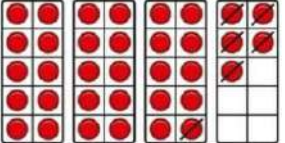
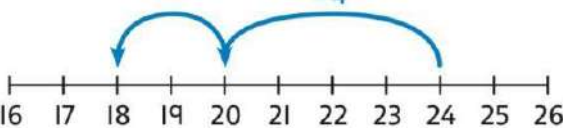
$17 + 10 +$



<p>Adding three digit numbers</p>	<p>$7 + 6 + 3 = 16$</p> <p>Combine to make 10 first or bridge 10 then add the third number.</p> <p>Build on tens frames.</p>	<p>Pictorial:</p> <p>First there were 4 children on the bus, then 3 more got on, then 2 more got on and now there are 9.</p> <p>$10 + 3 = 13$</p> <p>Make 10, either by tens frame or part- part whole model.</p> <p>Regroup and draw representation.</p> <p>$10 + 3 + 2 = 15$</p>	<p>$10 + 3 + 2$</p> <p>$20 + 5 = 25$ $40 + 7 = 47$ $20 + 40 = 60$ $5 + 7 = 12$ $60 + 12 = 72$</p> <p>$4 + 7 + 6 = 10 + 7 = 17$</p> <p>Combine the two numbers that make/ bridge ten then add on the third.</p>
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Subtraction

	Concrete	Pictorial	Abstract
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<p>Subtracting multiples of 10</p>	<p>Use known number bonds and unitising to subtract multiples of 10.</p>  <p>8 subtract 6 is 2. So, 8 tens subtract 6 tens is 2 tens.</p>	<p>Use known number bonds and unitising to subtract multiples of 10.</p>  <p>$10 - 3 = 7$ So, 10 tens subtract 3 tens is 7 tens.</p>	<p>Use known number bonds and unitising to subtract multiples of 10.</p>  <p>7 tens subtract 5 tens is 2 tens. $70 - 50 = 20$</p>
<p>Subtracting a single-digit number from a 2 digit number (not across a ten)</p>	<p>Subtract the 1s. This may be done in or out of a place value grid.</p> 	<p>Subtract the 1s. This may be done in or out of a place value grid.</p> 	<p>Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.</p> 
<p>Subtracting a single-digit number bridging 10 (subtract across a ten)</p>	<p>Bridge 10 by using known bonds.</p>  <p>$35 - 6$ I took away 5 counters, then 1 more. Use tens frame to build.</p>	<p>Bridge 10 by using known bonds.</p>  <p>$35 - 6$ First, I will subtract 5, then 1.</p>	<p>Bridge 10 by using known bonds.</p>  <p>$24 - 6 = ?$ $24 - 4 - 2 = ?$</p>

Make 15 on the ten frame. Take 5 away to make ten, then take 4 more away so that you have taken 9.

15 - 9 =

$15 - 9 =$
 $15 - 5 = 10$
 $10 - 4 = 6$
 $15 - 9 = 6$

14 - 6 = 8

4 2

15 - 9 =

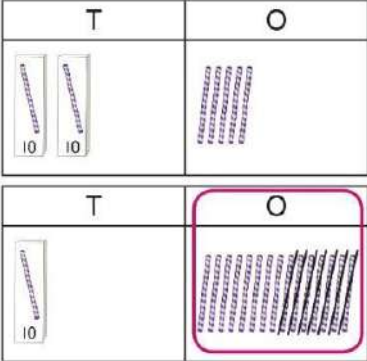
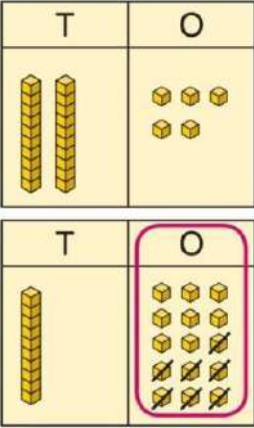
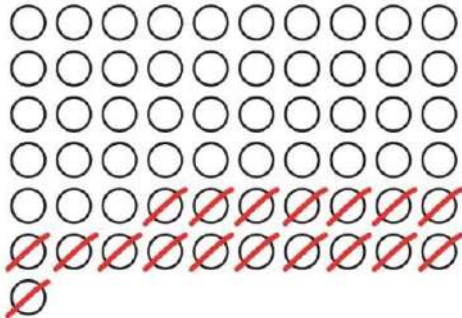
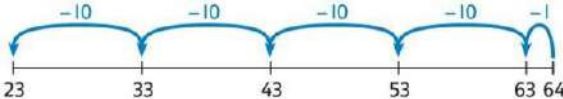
Jump back 5 first, then another 4. Use ten as the stopping point.

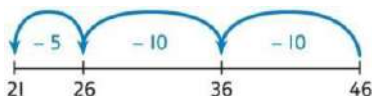
Example 3
 Draw representation of a tens frame or a number line.

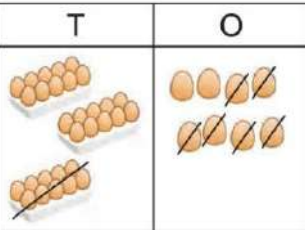

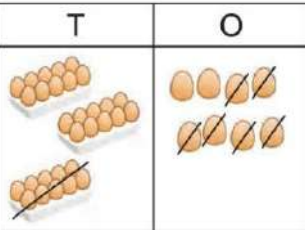





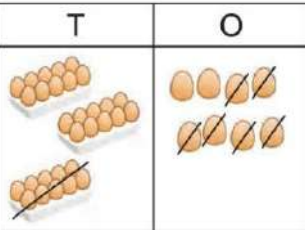



10 - _ = _

14 - 6 = 8

4 2



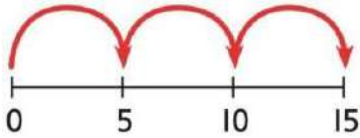

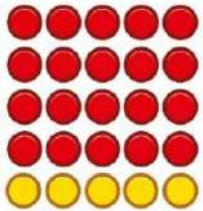
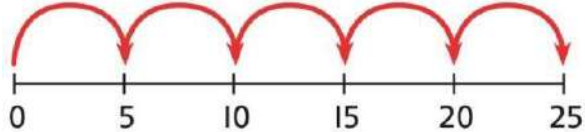

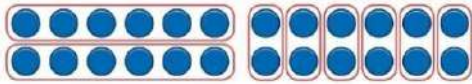

<p>Subtracting a single-digit number using exchange</p>	<p>Exchange 1 ten for 10 ones. This may be done in or out of a place value grid.</p> 	<p>Exchange 1 ten for 10 ones.</p> 	<p>Children do not need to set out their calculations using the column method, but should be encouraged to organise their manipulatives in a structured way.</p>																																																																																																				
<p>Subtracting a 2-digit number</p>	<p>Subtract by taking away.</p>  <p>$61 - 18$ I took away 1 ten and 8 ones.</p>	<p>Subtract the 10s and the 1s.</p> <p>This can be represented on a 100 square.</p> <table border="1" data-bbox="963 911 1328 1278"> <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	<p>Subtract the 10s and the 1s.</p>  <p>This can be represented on a number line.</p> <p>$64 - 41 = ?$</p> <p>$64 - 1 = 63$ $63 - 40 = 23$ $64 - 41 = 23$</p>
1	2	3	4	5	6	7	8	9	10																																																																																														
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			 <p style="margin-top: 10px;"> $46 - 20 = 26$ $26 - 5 = 21$ $46 - 25 = 21$ </p>
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<p>Subtracting a 2-digit number using place value and columns without exchange</p>	<p>Subtract the 1s. Then subtract the 10s. This may be done in or out of a place value grid.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 50px; text-align: center;">T</th> <th style="width: 50px; text-align: center;">O</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> </tbody> </table> <p style="margin-top: 10px;">$38 - 16 = 22$</p>	T	O			<p>Subtract the 1s. Then subtract the 10s.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 50px; text-align: center;">Tens</th> <th style="width: 50px; text-align: center;">Ones</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">  </td> </tr> </tbody> </table>	Tens	Ones			
T	O										
											
Tens	Ones										
											

<p>Subtracting a 2-digit number with exchange</p>	<p>65 – 28</p>	<p>Exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s. 45 – 27</p>	<p>Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient.</p> <p>65- 28</p>
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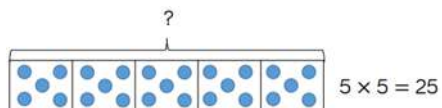
<h2>Multiplication</h2>			
	<p>Concrete</p>	<p>Pictorial</p>	<p>Abstract</p>

<p>Equal groups and repeated addition</p>	<p>Recognise equal groups and write as repeated addition and as multiplication.</p>  <p><i>3 groups of 5 chairs</i> <i>15 chairs altogether</i></p>	<p>Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication.</p>  <p><i>3 groups of 5</i> <i>15 in total</i></p>	<p>Use a number line and write as repeated addition and as multiplication.</p>  <p>$5 + 5 + 5 = 15$ $3 \times 5 = 15$</p>
<p>Using arrays to represent multiplication and support understanding</p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p><i>4 groups of 5</i></p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p><i>4 groups of 5 ... 5 groups of 5</i></p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>$5 \times 5 = 25$</p>
<p>Understanding commutativity</p>	<p>Understanding commutativity (2s, 5s, 10s)</p> <p>Build arrays to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.</p> 	<p>Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.</p>  <p><i>This is 2 groups of 6 and also 6 groups of 2.</i></p>	<p>Use arrays to visualise commutativity.</p>  <p>$4 + 4 + 4 + 4 + 4 = 20$ $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ and $5 \times 4 = 20$</p>

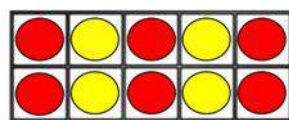
Repeated Addition (2s, 5s, 10s)
5s, 10s)

2x table, 5x table, 10x table

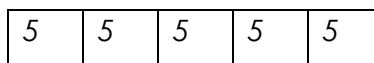
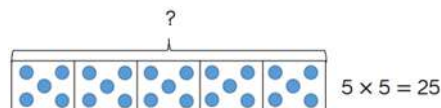
Repeated addition (2, 5s, 10s)
Representation- single bar model. Build with counters.



Use different models for 2s, 5s and 10s to develop fluency.



Representation- single bar model. Draw with counters.



$5 \times 5 = 25$

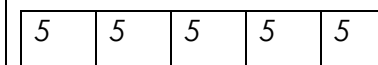
Use different representations for 2s, 5s and 10s to develop fluency

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

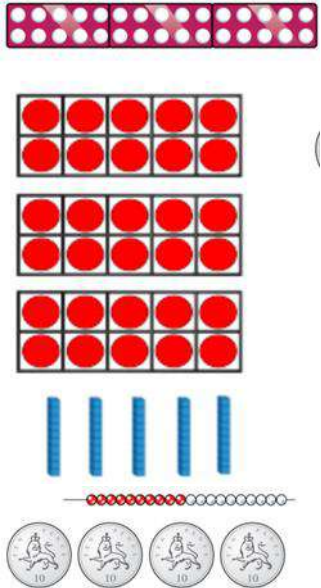
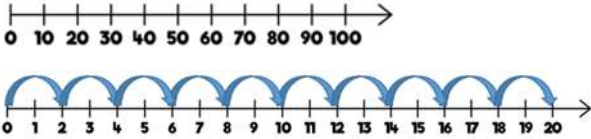
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71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Placing digits into the bar model to represent the multiplication.



$5 \times 5 = 25$

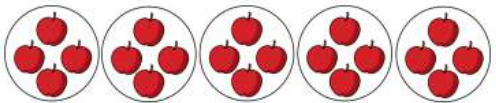
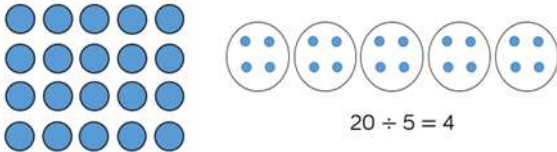
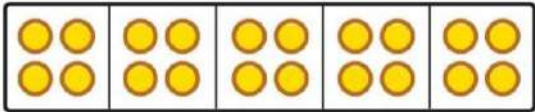
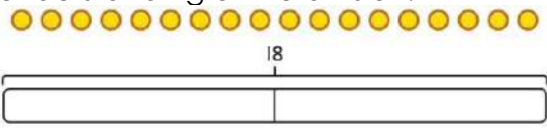
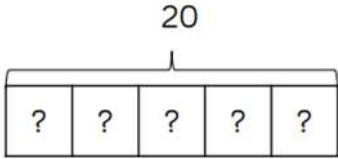
		
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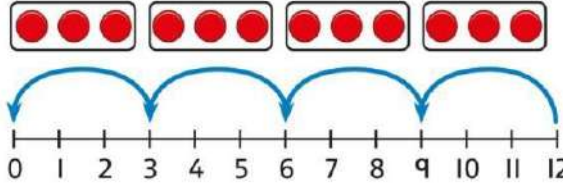
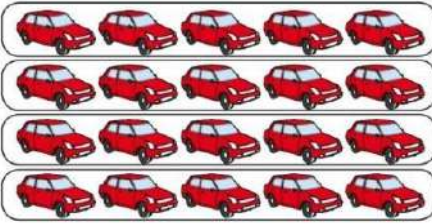
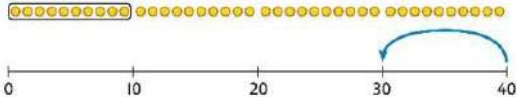
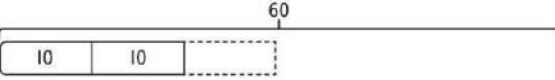
Division

Concrete

Pictorial

Abstract

<p>Sharing equally</p>	<p>Solve problems using multiplication (sharing)</p>  <p>20 shared equally between 5 = 20</p> <p>Use counters and cubes to share.</p>	<p>Solve problems using multiplication (sharing)</p>  <p>$20 \div 5 = 4$</p> <p>Represent the objects shared into equal parts using a bar model.</p>  <p>20 shared into 5 equal parts. There are 4 in each part.</p>	<p>Solve problems using multiplication (sharing)</p> <p>Use a bar model to support understanding of the division.</p>  <p>$18 \div 2 = 9$</p> 
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<p>Grouping equally</p>	<p>Understand how to make equal groups from a whole.</p>  <p><i>8 divided into 4 equal groups. There are 2 in each group.</i></p>	<p>Understand the relationship between grouping and the division statements.</p> <p>$12 \div 3 = 4$</p>  <p>$12 \div 4 = 3$</p>  <p>$12 \div 6 = 2$</p>  <p>$12 \div 2 = 6$</p> 	<p>Understand how to relate division by grouping to repeated subtraction.</p>  <p>There are 4 groups now.</p> <p><i>12 divided into groups of 3. $12 \div 3 = 4$</i></p> <p><i>There are 4 groups.</i></p>
<p>Using known times-tables to solve divisions</p>	<p>Understand the relationship between multiplication facts and division.</p>  <p><i>4 groups of 5 cars is 20 cars in total. 20 divided by 4 is 5.</i></p>	<p>Link equal grouping with repeated subtraction and known times-table facts to support division.</p>  <p><i>40 divided by 4 is 10.</i></p> <p>Use a bar model to support understanding of the link between times-table knowledge and division.</p> 	<p>Relate times-table knowledge directly to division.</p> <p>$1 \times 10 = 10$ $2 \times 10 = 20$ $3 \times 10 = 30$ $4 \times 10 = 40$ $5 \times 10 = 50$ $6 \times 10 = 60$ $7 \times 10 = 70$ $8 \times 10 = 80$</p> <div style="border: 1px solid orange; border-radius: 15px; padding: 10px; display: inline-block;"> <p>I used the 10 times-table to help me. $3 \times 10 = 30$.</p> </div> <p><i>I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.</i></p> <p>$3 \times 10 = 30$ so $30 \div 10 = 3$</p>