



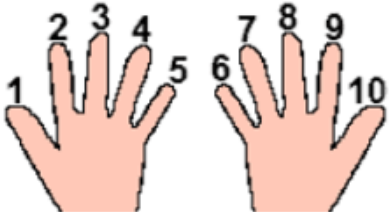
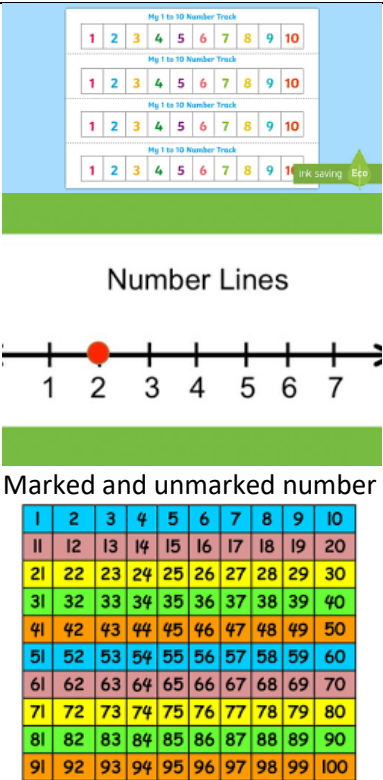
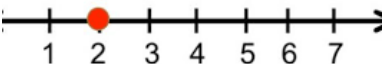
Brewster Avenue Infant School

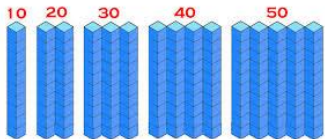
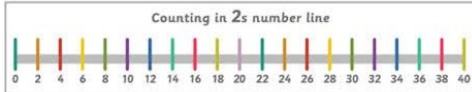
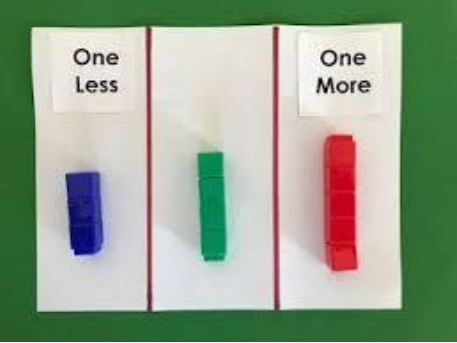
Calculation Policy

EYFS	
Key experiences before Year 1	
• Know the rules of counting i.e. we say the numbers in order, one number name per item and that the last number reached tells you how many in total (cardinal principle). • Begin to develop a sense of the number system by verbally counting forward to and beyond 20, pausing at each multiple of 10. • Play games that involve moving along a numbered track, and understand that larger numbers are further along the track. • Begin to experience partitioning and combining numbers within 10. • Distribute items fairly, for example, put 3 marbles in each bag. Recognise when items are distributed unfairly. • Understand the cardinal value of number words, for example understanding that 'four' relates to 4 objects. • Subitise for up to 5 items. • Automatically show a given number using fingers. • Devise and record number stories, using pictures, numbers and symbols (such as arrows). • Extend and create ABAB patterns.	
Reception Term 1	
Matching and sorting	Matching socks, Numicon base boards. Sort a range of objects based on different properties e.g. buttons
Comparing amounts	Compare sets of items. Which has most/fewest?
Representing 1,2 and 3	Count 1,2,3 objects, dots, jumps, claps, fingers.
Comparing 1,2 and 3	Compare sets of 1,2 and 3 items. Compare and order patterns of dots.
Composition of 1,2 and 3	Use Numicon to make 2 and 3. Arrangements of dots on dominoes/ladybirds. Double-sided counters. Stories such as Three Billy Goats Gruff.
Representing numbers to 5	
1 more and 1 less	

Reception Term 2 and beyond	
Introduce zero	Number songs e.g. Five Little Monkeys. How many are left at the end? Contrast familiar numbers with zero.
Compare numbers to 5	Compare quantities using objects and representations.
Composition of 4 and 5	Explore the different ways of making 4 and 5. Notice that numbers can be made from two parts or more than two parts
6,7 and 8	Arrange 6,7 and 8 in to smaller groups so that children can see how numbers are made of smaller numbers e.g. 4 and 4 to make 8.
Making pairs	Arrange quantities in to pairs. Begin to see that there will be one item without a partner with odd numbers.
Combining two groups	Count in ones to find how many altogether.
9 and 10	Represent nine and ten in different ways. Subitise ten by seeing that a full tens frame has ten items.
Comparing numbers to 10	Compare sets of items and compare their position in the counting order. Begin to order three or more quantities.
Bonds to ten	Explore bonds to ten using real objects.

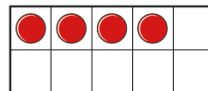
Progression in Number and Place Value

Objective	Concrete	Pictorial	Abstract
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	 	 Number Lines  Marked and unmarked number lines.  Gattegno Chart  Gattegno Chart	0,1,2,3..... 10,9,8,7,6... 6,7,8,9,10,11,12.... 34,35,36,37..... 99,98,97,96.... Counting with number names and number structures e.g. 7,8,9,10, one ten, one ten one, one ten two, one ten three...

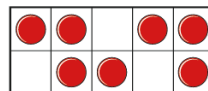
count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s	 	 Skip Counting by 10s  	2,4,6,8... 0,5,10,15... 20,30,40, 50... 35,25,15... Count in odds and evens forwards and backwards
given a number, identify 1 more and 1 less		 	What is 1 more than 7?



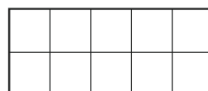
Draw 1 more than 4



Draw 1 more than 7



Draw 1 more than 5



L.O: Can I recall one more?

What number?	What number?	What number?
One more?	One more?	One more?
_____	_____	_____
What number?	What number?	What number?
One more?	One more?	One more?
_____	_____	_____
What number?	What number?	What number?
One more?	One more?	One more?
_____	_____	_____

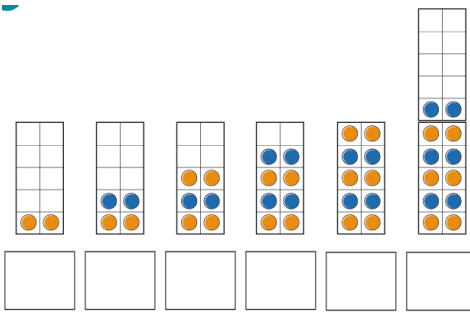
count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward



Numicon



Number tracks, number lines



0,3,6,9

12,15,18

20,17,14,11

Circle the number that does not fit the pattern.

- a) 4, 6, 8, 9, 10, 12, 14
b) 40, 30, 20, 10, 5, 0
c) 10, 20, 30, 35, 40, 50

How did you spot the odd one out?

Count forwards and backwards in 10s from 64

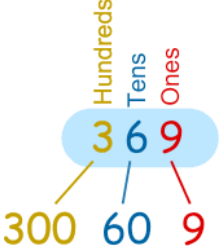
forwards	64			
backwards	64			

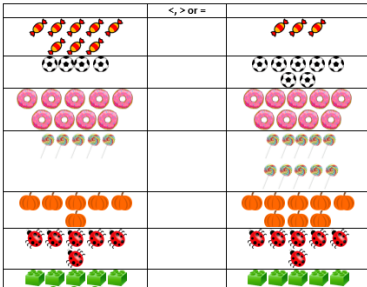
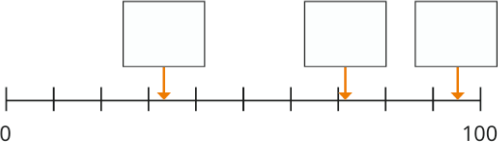
recognise the place value of each digit in a two-digit number (10s, 1s)



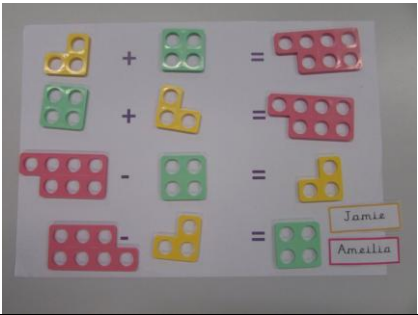
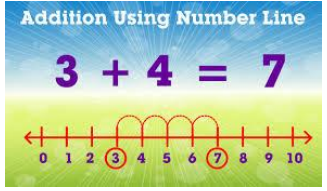
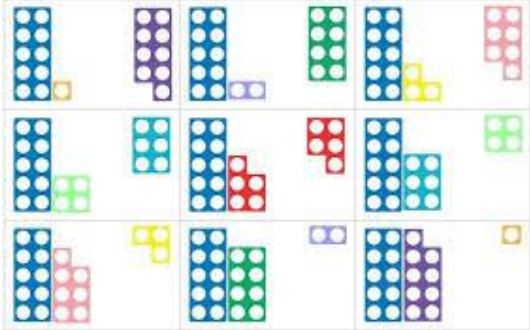
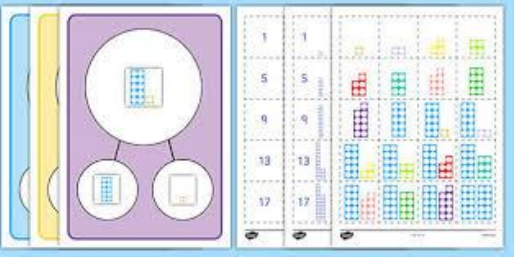
Put all the tens and ones on the place value grid to make two numbers.

Tens	Ones	Tens	Ones

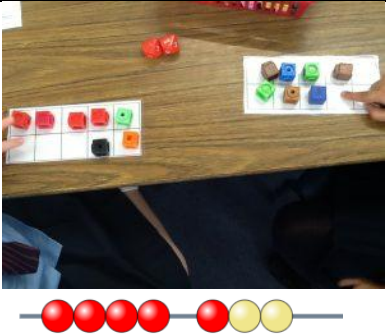
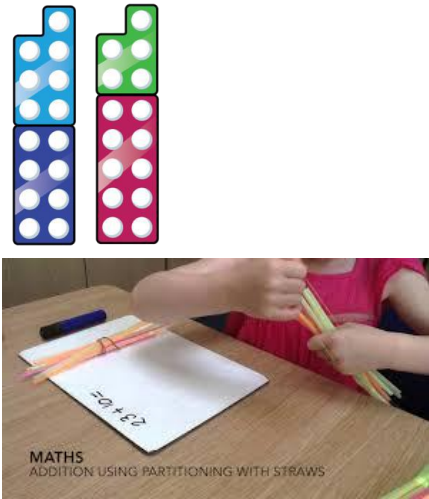
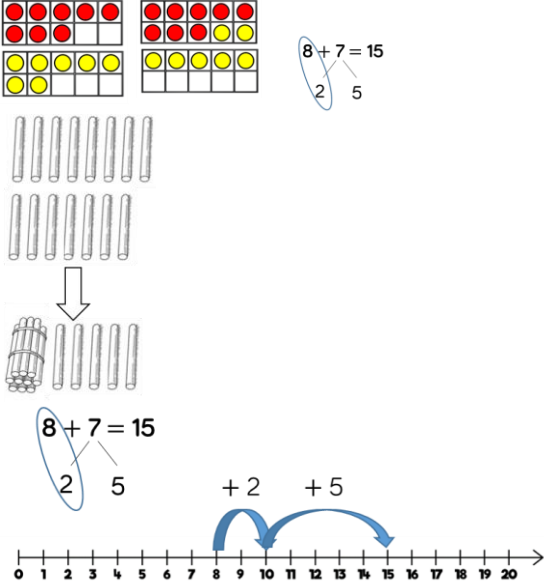
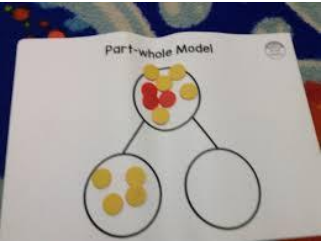


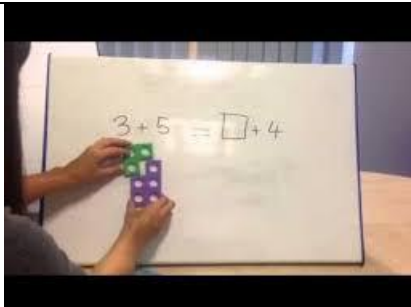
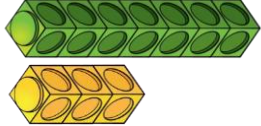
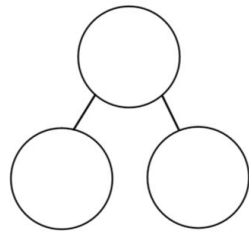
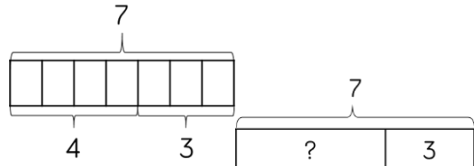
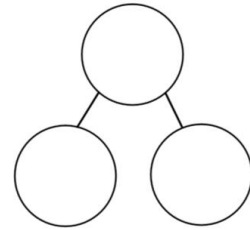
	 		
compare and order numbers from 0 up to 100; use <, > and = signs		 Marked and unmarked number lines. Children should be able to estimate and reason about the position of numbers on the number line e.g. '16 is about here as it is just over half way between 10 and 20.' Estimate the numbers the arrows are pointing to. 	4>3 22<23 10=10 Write <, > or = to compare the numbers. a) 50 50 + 7 b) 10 + 20 10 + 16 c) 50 40 + 17 d) 30 ones 10 + 19

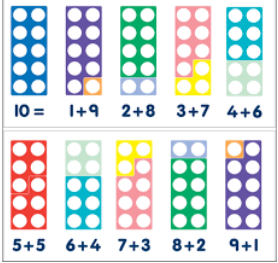
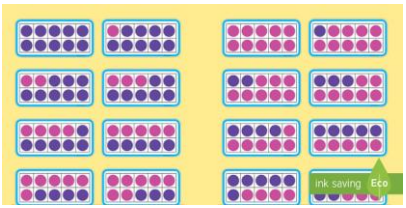
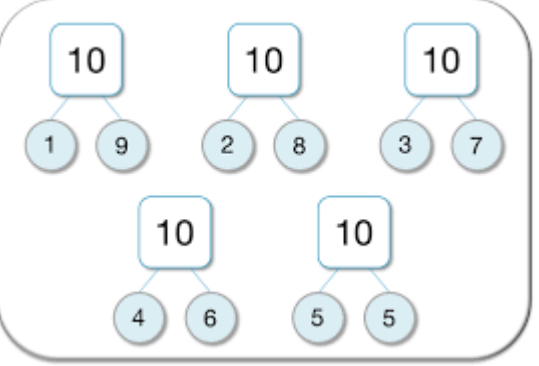
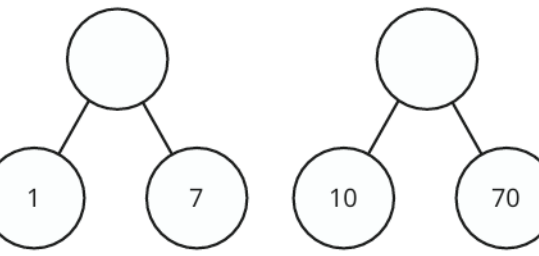
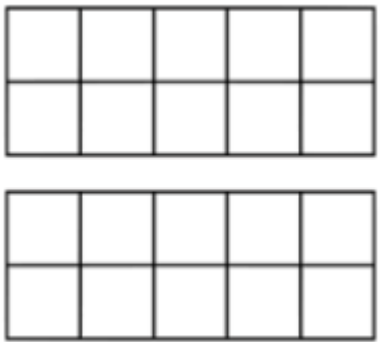
Progression in Addition and Subtraction

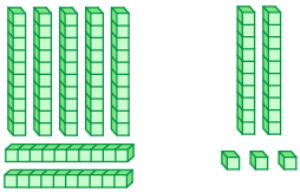
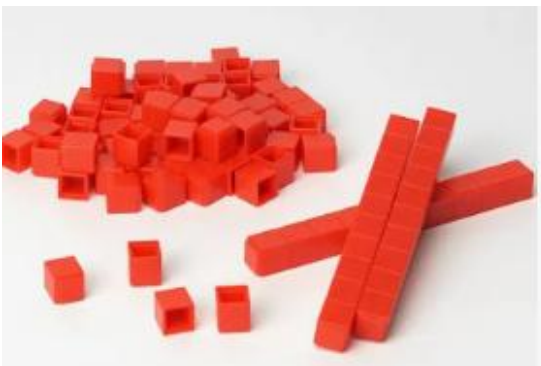
Objectives	Concrete	Pictorial	Abstract
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs	Children should use mathematical language relating to addition and subtraction during practical activities before being introduced to the signs. Children also need to understand that equals means balance. Numicon scales should be used to reinforce this.  	4+3  8+5  9-2  13-7  	4+3= Equality and Balancing: Showing that both sides of the equals sign have the same value (e.g., $4 + 2 = 3 + 3$).
represent and use number bonds and related subtraction facts within 20		 Pictorial part whole models	Work methodically to represent all number bonds.

		Part whole models alongside quantity images to support development of the understanding of quantity. Tens frames </
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To 20			$8 + 7 = 15$
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing		Find the missing part.	$7 = \square - 9$

number problems such as $7 = \square - 9$		Whole Unknown Kevin has 5 sheep and 4 cows. How many animals does he have on his farm altogether? <table border="1"><tr><td colspan="2">?</td></tr><tr><td>4</td><td>5</td></tr></table> Part Unknown Sophie has 13 blue and orange smarties, 7 are orange. How many blue smarties does she have? <table border="1"><tr><td colspan="2">13</td></tr><tr><td>?</td><td>7</td></tr></table>	?		4	5	13		?	7																																																					
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Subtract 1-digit numbers within 10	Using cubes to find the difference  Partition  Partition/Reduction First Then Now <table border="1"><tr><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>●</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table><table border="1"><tr><td>●</td><td>●</td><td>●</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td>●</td><td>●</td><td>●</td><td></td><td></td><td></td></tr></table><table border="1"><tr><td>●</td><td>●</td><td>●</td><td>●</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> Partition/Reduction 	●	●	●	●	●						●	●									●	●	●	●											●	●	●				●	●	●	●																	Partition/Reduction  Reduction  Partition 	$7 - 3 = 4$
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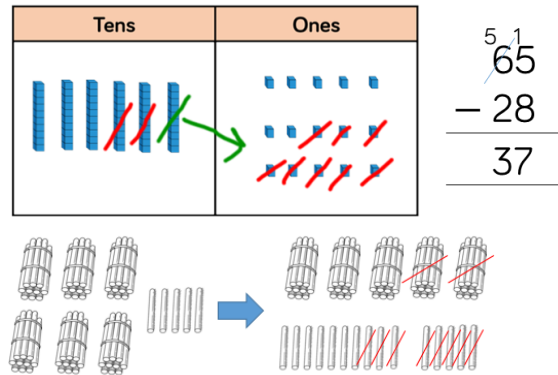
Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.	 Tens frames 	 	Related facts to 100 $7 + 2 = 9$ e) $3 + 4 = \square$ $70 + 20 = \square$ $30 + \square = 70$
Add and subtract numbers using concrete objects, pictorial presentations and mentally including: 2 digit number and ones 2 digit number and tens	Tens frames 	Adding to the nearest ten then counting on (single digit) Name _____ Date _____ Adding Within 20 Using Ten Frames Directions: Use the ten frames to add. Draw more to make the number sentence true. Then write the answer. $9 + 3 = \square$ $6 + 5 = \square$ $8 + 7 = \square$ $4 + 9 = \square$ $7 + 5 = \square$ $6 + 8 = \square$ $9 + 9 = \square$ $7 + 9 = \square$	$38 + 5 = 43$

Two 2 digit numbers	 Dienes 	Not crossing 10:  $\square + \square = \square$ Crossing ten: Exchanging when using dienes, e.g $56 + 35$. Exchanging $6 + 5$ for 1 ten and 1 one, then adding to the total. Other methods for crossing ten: Add the tens first then add the ones, then add both together (see abstract example)	$38 + 23$ $30 + 20$ $8 + 3$ $38 + 23 = 61$
Subtract 1 and 2-digit numbers to 100		Subtract tens and then count back using number lines and number squares	$65 - 28 = 37$

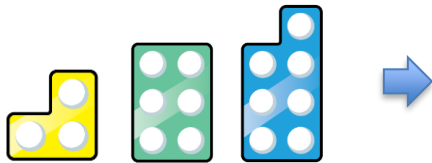


HUNDRED BOARD									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

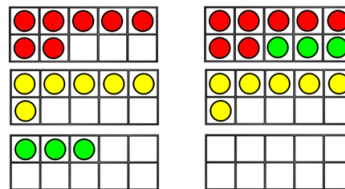
Echanging:



Add three 1 digit numbers

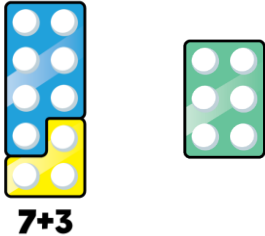
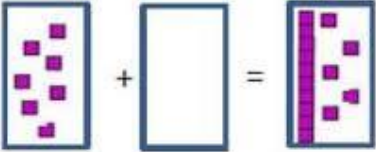


Part whole model

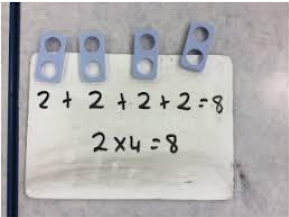
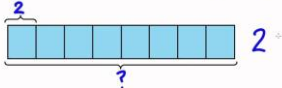


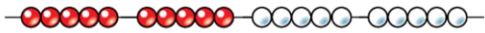
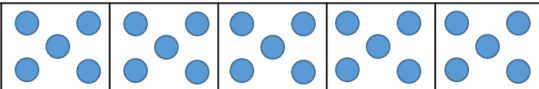
$$7+6+3=16$$

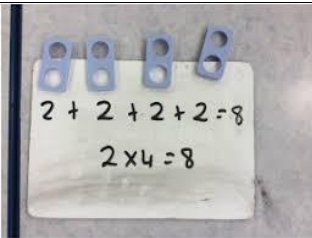
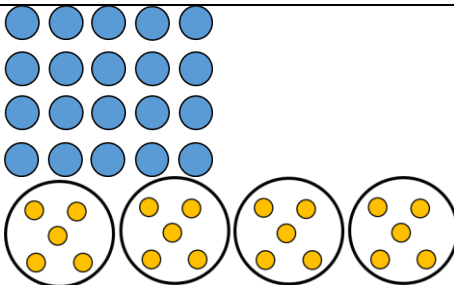
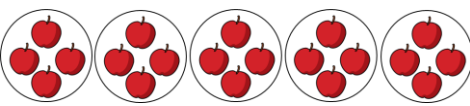
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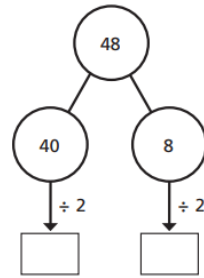
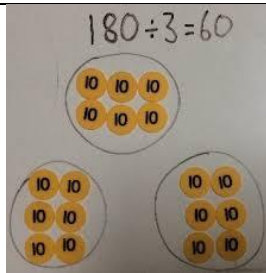
	 7+3		Find the total of each row and column. <table border="1"> <tr> <td>5</td><td>4</td><td>2</td><td></td></tr> <tr> <td>3</td><td>7</td><td>8</td><td></td></tr> <tr> <td>5</td><td>7</td><td>3</td><td></td></tr> <tr> <td></td><td></td><td></td><td></td></tr> </table>	5	4	2		3	7	8		5	7	3					
5	4	2																	
3	7	8																	
5	7	3																	
Solve problems with addition and subtraction: · using concrete objects and pictorial representations, including those involving numbers, quantities and measures · applying their increasing knowledge of mental and written methods	• Use Base 10 to help you find the missing number.  • David has 6 cubes. George has 3 more cubes than David. How many cubes do they have altogether? Use the ten frames to help you find your answer.																		

Progression in Multiplication and Division

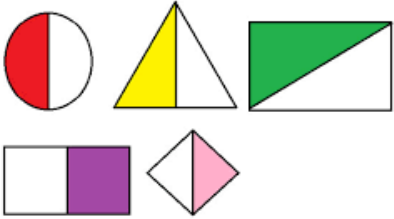
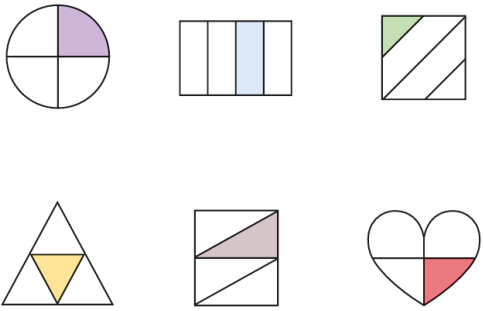
Objectives solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Repeated addition with Numicon  Arrays with objects  Numicon array board 	A milk carton contains <u>2 l</u> of milk. The cartons are packed into boxes. Each box can hold <u>8</u> cartons. What is the volume of milk in <u>1</u> box?  matholia Scaling problems e.g. There are 3 girls in a group. There are five time more boys than girls. How many boys are there? Boys <table><tr><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr></table> Girls <table><tr><td>3</td></tr></table> Children draws their own array	3	3	3	3	3	3	8x2=16
3	3	3	3	3					
3									

recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	  	Highlight patterns on a hundred square <table><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> Odd and even b) Group the socks in 2s to show that 17 is odd.  Colour all the even numbers. <table><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></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	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	Recall multiplication facts 3x2= Odd and even Tiny is looking at odd and even numbers.  30 is an odd number because 3 is an odd number. Do you agree with Tiny? Explain your answer.
1	2	3	4	5	6	7	8	9	10																																																																																																																																						
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calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals (=) signs	Bar model  Place cubes, counters etc in the bar before moving on to inserting digits. Repeated addition with Numicon	Number tracks (and labeled number lines) to count in multiples 	3 x 6 = 18																																																																																																																																												

	 $2 + 2 + 2 + 2 = 8$ $2 \times 4 = 8$ $5 \times 3 = 15$ 								
Solve one-step problems involving multiplication	Represent multiplication as repeated addition in many ways.  		$5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$						
Solve one-step problems involving multiplication (sharing) and division (grouping)			$20 \div 5 = 4$						
Divide 2-digits by 1-digit (sharing with no exchange)	Straws/Base 10 Divide the tens divide the ones. Place value counters	<table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	Tens	Ones					$48 \div 2 = 24$
Tens	Ones								
									
									



Progression in Fractions

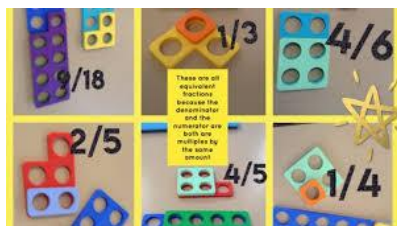
Objective	Concrete	Pictorial	Abstract
recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	  	Pictorial  Colour half of the shape. 	Abstract Children are not required to write fractions at this stage.

recognise, find, name
and write fractions
write simple fractions

Ensure children know the difference between equal and non-equal parts.

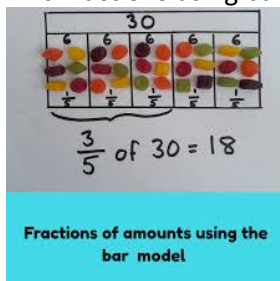
Sharing beanbags in to a container to make two equal groups.

Share the sweets between 4 people.

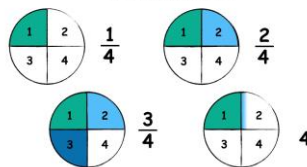


Find fractions of given numbers with Numicon.

Find fractions using bar models and objects.

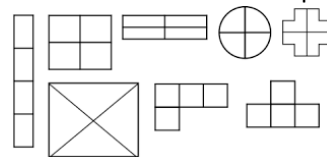


How do we name fractions?

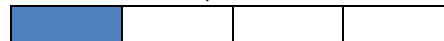


Matching pictures and fraction.

What fraction of the shapes has been coloured?



$\frac{1}{4}$ is shaded blue, what fraction is white?

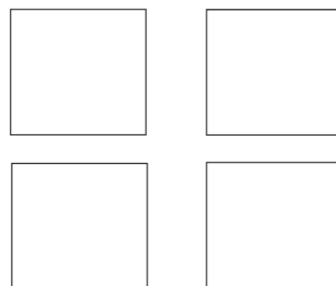


Children should be able to count in fractions from 0.



Colour $\frac{1}{2}$ of each square.

Show four different ways.



$$\frac{1}{2} \text{ of } 6 = 3$$