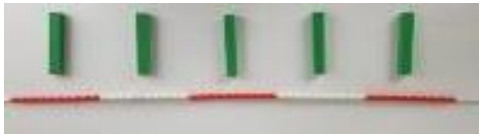
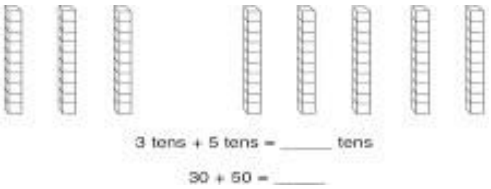
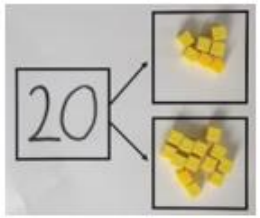
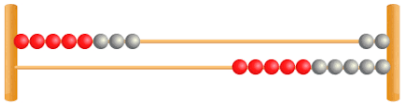
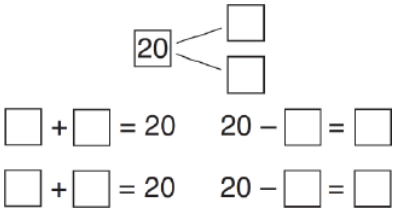
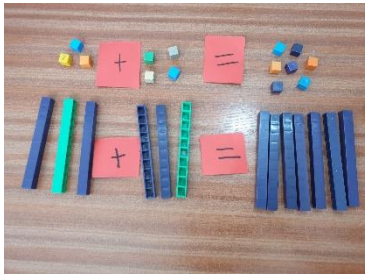
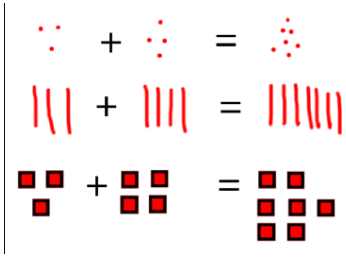
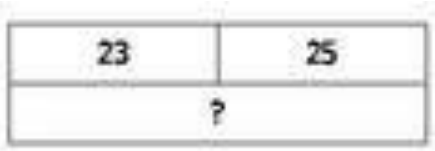
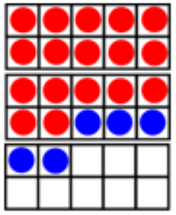
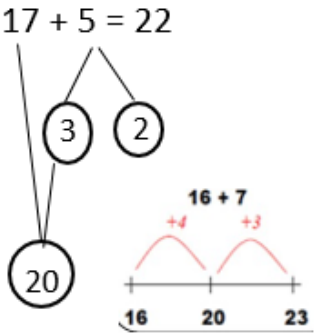
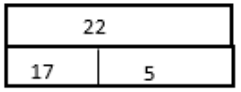
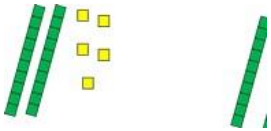
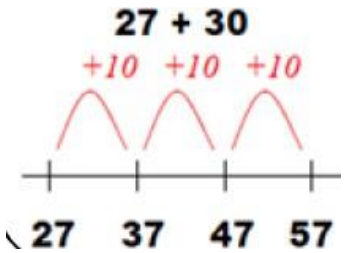
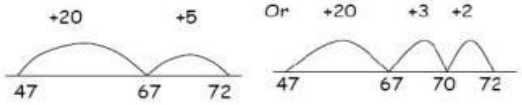
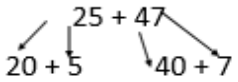
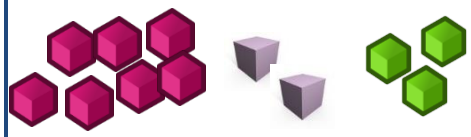
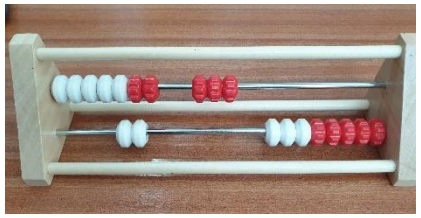
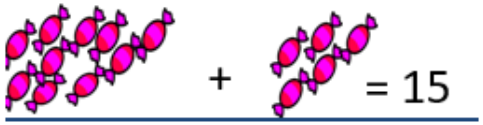
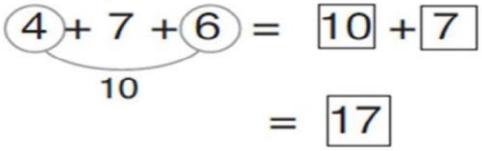
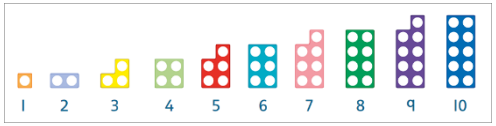
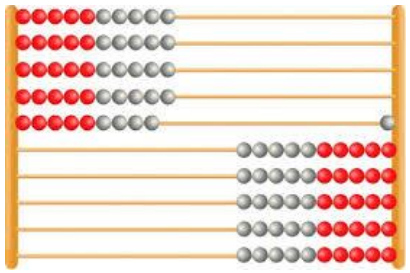
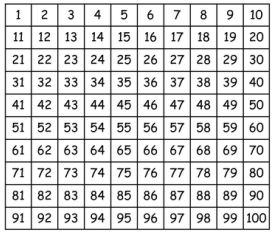
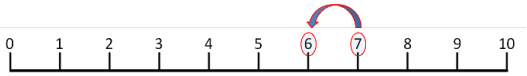
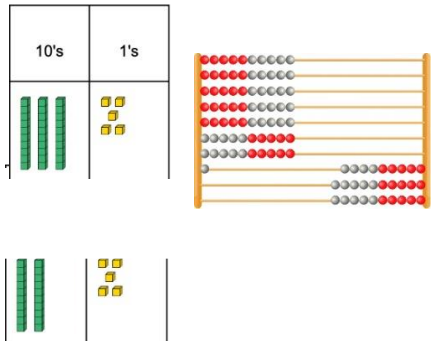
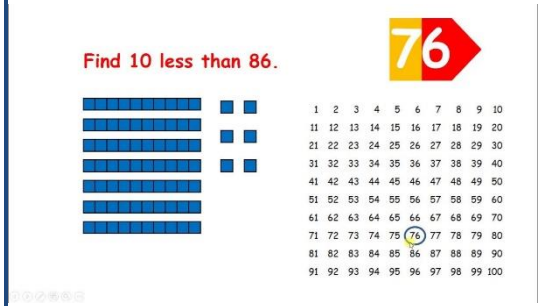
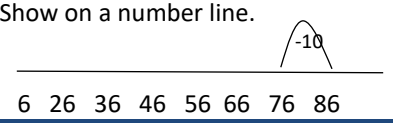
Addition + Year 2

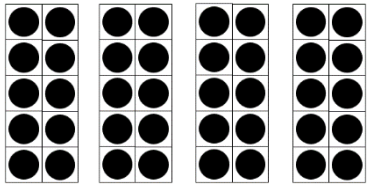
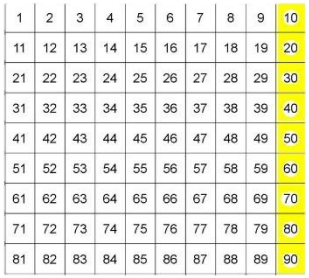
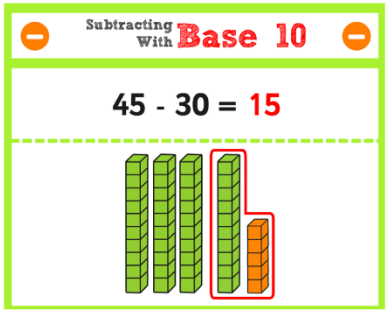
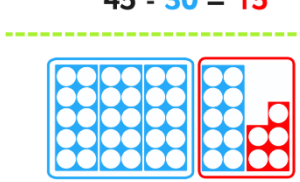
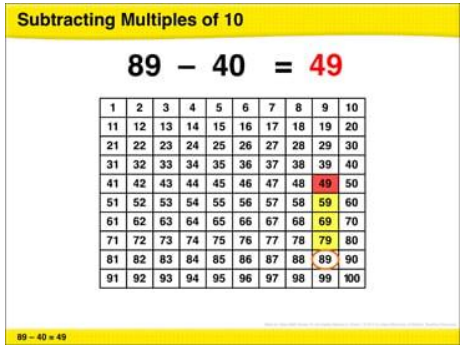
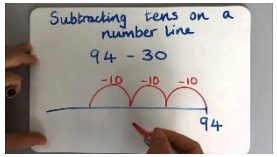
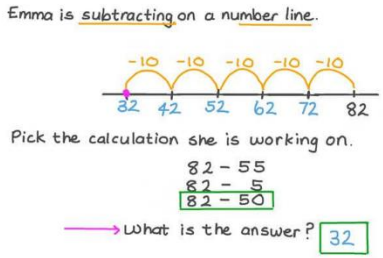
Objective &Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	50= 30 = 20  Model using dienes and bead strings	 Use representations for base ten.	20 + 30 = 50 70 = 50 + 20 40 + □ = 60
Use known number facts Part part whole	 Children explore ways of making numbers within 20 		□ + 1 = 16 1 + □ = 16 16 – 1 = □ 16 – □ = 1
Using known facts to build from		 Children draw representations of H,T and O	3 + 4 = 7 *leads to* 30 + 40 = 70 *leads to* 300 + 400 = 700

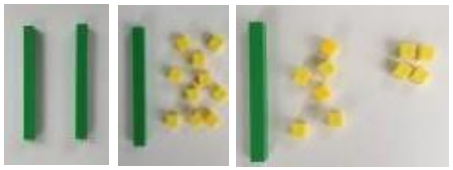
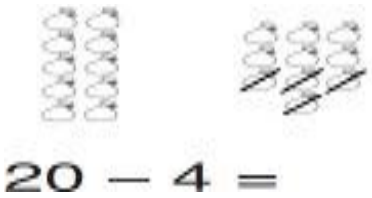
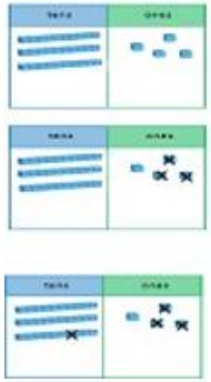
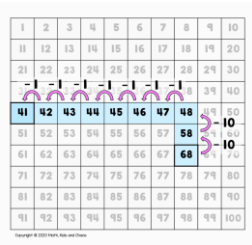
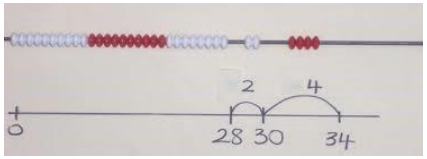
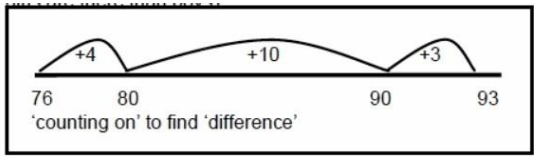
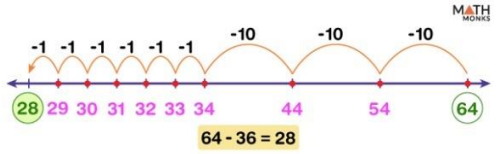
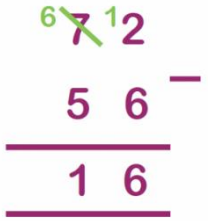
Bar model	Use actual objects to lay out in the formation of a bar model. 3 + 4 = 7	Use picture representations in the bar model. Turn the pictures into numbers. 7 + 3 = 10	 23 + 25 = 48
Add a two digit number and ones	 17 + 5 = 22 Use ten frame to make 'magic ten Children explore the pattern. 17 + 5 = 22 27 + 5 = 32	Use part part whole and number line to model. 	17 + 5 = 22 Explore related facts 17 + 5 = 22 5 + 17 = 22 22—17 = 5 22—5 = 17 
Add a 2 digit number and tens	 25 + 10 = 35 Explore that the ones digit does not change		27 + 10 = 37 27 + 20 = 47 27 + □ = 57 27 + 10 37

Add two 2-digit numbers	 Model using dienes , place value counters and numicon	 Use number line and bridge ten using part whole if necessary.	 20 + 40 = 60 5+ 7 =12 60 + 12 = 72 25 +47 72 1
Add three 1-digit numbers	 Combine to make 10 first if possible, or bridge 10 then add third digit. 	 Regroup and draw representation. 	 Combine the two numbers that make/ bridge ten then add on the third. Reorder the digits to make adding easier. Partition a number to get to a ten to help with adding. 8 + 7 + 5 = 2 5 8 + 2 + 5 + 5 = 10 + 10 = 20

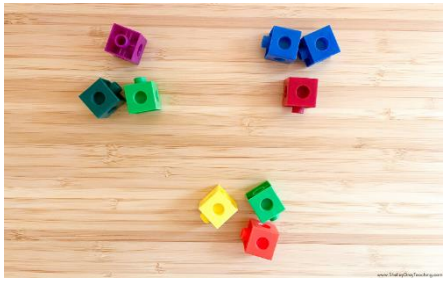
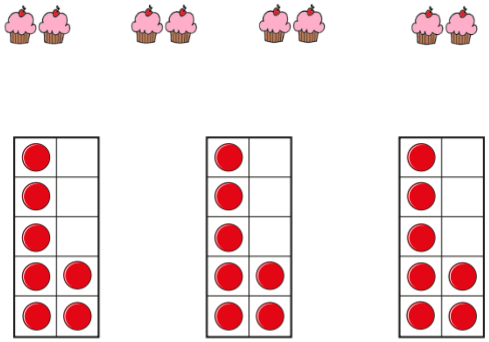
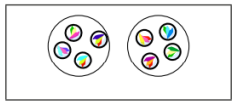
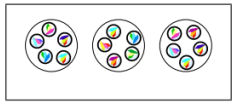
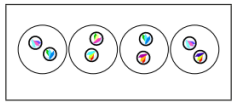
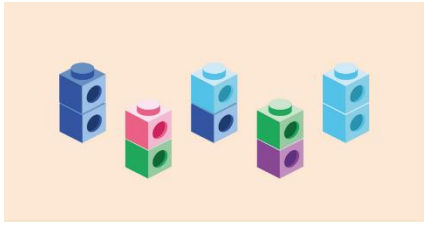
Subtraction - Year 2

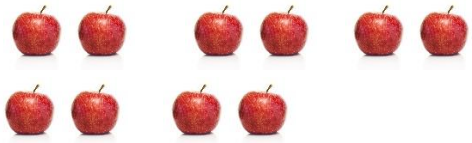
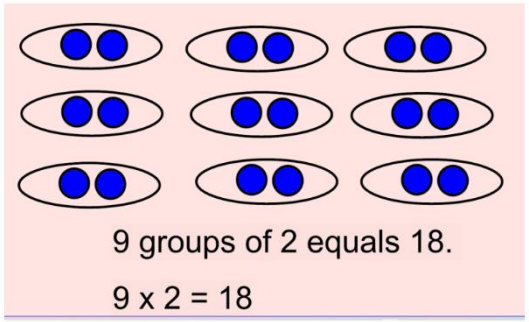
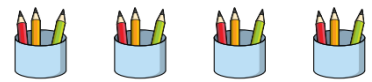
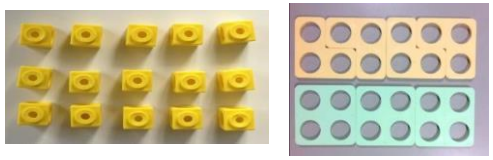
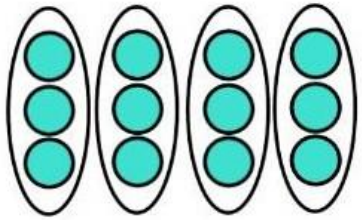
Objective & Strategy	Concrete	Pictorial	Abstract
Subtract 1 / 1 less	Use objects, numicon, rek n rek , dienes equipment to make a number and then show 1 less than.  	Use a 100 square to help find 1 less than a number. Discuss patterns seen.  Show on a number line.  	18 – 1 = 17 29 - □ = 28 □ - 1 = 34 Explore patterns and explain what can be seen happening in the numbers: 60 – 1 = 59 50 – 1 = 49 40 – 1 = 39
Subtract 10 / 10 less	Make using dienes equipment, beads strings, rek nrek.  	Use the 100 square to help find 10 less than a number. Discuss patterns seen.  Show on a number line.  	98 – 10 = 88 47 - □ = 37 □ - 10 = 63 Explore patterns and explain what can be seen happening in the numbers: 78 – 10 = 68 68 – 10 = 58 58 – 10 = 48

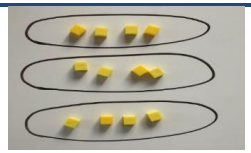
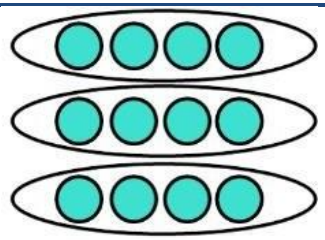
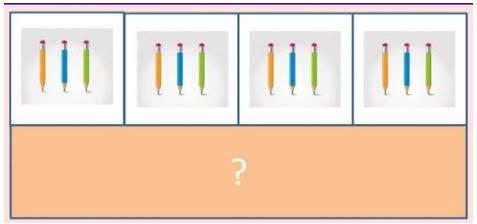
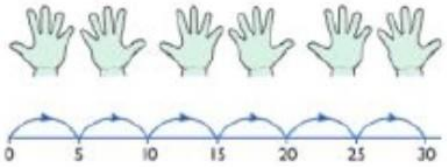
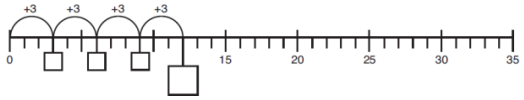
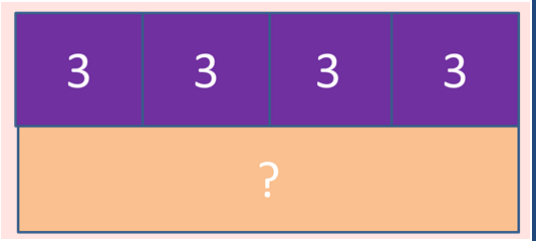
Subtract ones from a 10s number	Use 10s frames.  Use bead strings, rek n rek. 	Use a 100 square. Count backwards from a 10s number. 	60 – 7 = 53 80 - ☐ = 71 ☐ - 8 = 22 Explore patterns and explain what can be seen happening in the numbers: 60 – 9 = 51 60 – 8 = 52 60 – 7 = 53
Subtract 10s	Use dienes equipment. Make the number and then subtract the 10s.  Use numicon to make the number and then subtract the 10s: 	Work out using a 100 square.  Show on a number line.  	87 – 30 = 57 95 - ☐ = 45 ☐ - 20 = 31 Explore patterns and explain what can be seen: 94 – 10 = 84 94 – 20 = 74 94 – 30 = 64 Column method 84 - 30 54

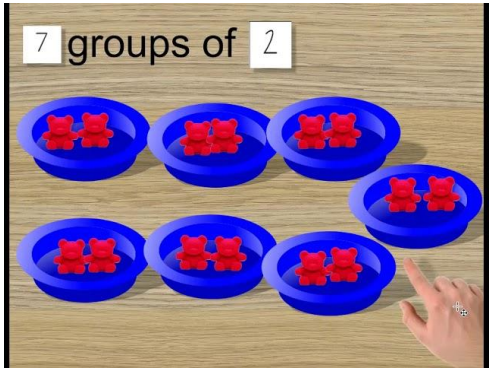
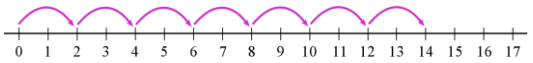
Regroup a ten into ten ones	 Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'	 20 — 4 =	20—4 = 16
Partitioning to subtract without re-grouping. *'Friendly numbers'*	34—13 = 21  Use Dienes to show how to partition the number when subtracting without regrouping.	Children draw representations of Dienes and cross off. 43—21 = 22 Use a 100 square 	43—21 = 22 43 - 21 22
Subtracting across 10s. Make ten strategy *Progression should be crossing one ten, crossing more than one ten.*	 34—28 Use a bead bar or bead strings to model counting to next ten and the rest.	 'counting on' to find 'difference' Use a number line to count on to next ten and then the rest. Use the number line to count back the 10's, count back the 1's.  64 - 36 = 28	93—76 = 17 

Multiplication X Year 2

Objective & Strategy	Concrete	Pictorial	Abstract
Recognise and make equal groups	Make equal groups using objects.  	Pictures of equal groups. Say what you can see.  There are ☐ equal groups with ☐ in each group.	There are 3 equal groups with 5 in each group.  There are 4 equal groups with 2 in each group.  There are 2 equal groups with 4 in each group. 
Add equal groups	Make equal groups using objects, dienes equipment, numicon. Count the objects made to find a total. 	Write a number sentence to match the picture. 	Max has five of the same coins. How much money does Max have if these are the coins? a) Max has five 1p coins. ☐ p b) Max has five 2p coins. ☐ p c) Max has five 5p coins. ☐ p d) Max has five 10p coins ☐ p

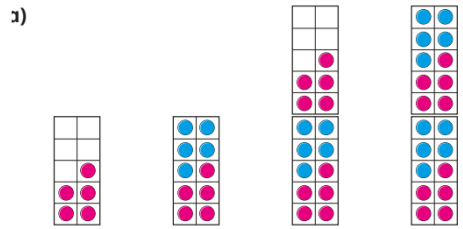
Multiplication sentences	Make groups using real objects, dienes, numicon, to help explore sentences that can be made.  5 groups of 2 apples equals 10 apples. 5 groups of 2 makes 10. 5 lots of 2 apples equals 10 apples. 5 apples multiplied by 2 apples equals 10 apples.	Use pictures of groups of objects to make up sentences. Draw groups.  9 groups of 2 equals 18. 9 x 2 = 18  3 + 3 + 3 + 3 = ☐ ☐ lots of 3 = ☐ ☐ × 3 = ☐	5 lots of 2 = 10 5 groups of 2 = 10 5 x 2 = 10 What is the same about the sentences? What is different? My answer is 12. What multiplication could it be?
Multiplication is commutative – Use arrays	Create arrays using counters and cubes and Numicon.  Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.	Use representations of arrays to show different calculations and explore commutativity. Draw the arrays themselves to explore calculations that can be made. 	Children to be able to use an array to write a range of calculations e.g. 10 = 2 × 5 5 × 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5

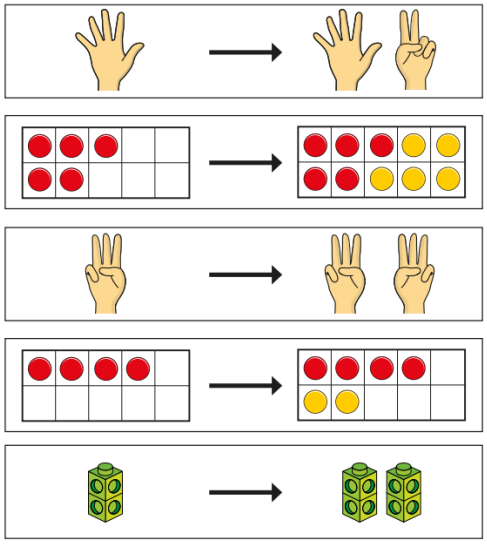
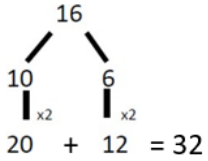
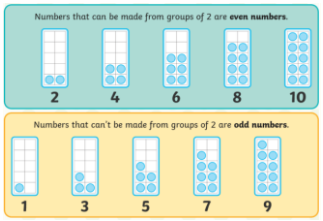
			
Counting in multiples of 2, 5, 10 from 0 (repeated addition)	Count the groups as children are skip counting, children may use their fingers as they are skip counting. 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40 Use concrete objects to make bar models 	Number lines, counting sticks and bar models should be used to show representation of counting in multiples.   	Count in multiples of a number aloud. Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10 0, 5, 10, 15, 20, 25, 30 Missing numbers in number patterns. 5 10 15 ? 25 30 35 ? 45 50 2 4 6 8 10 ? 14 16 24 26 28 ? 32 34 36 ?

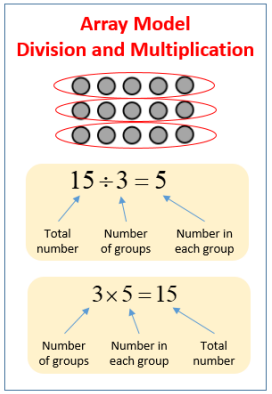
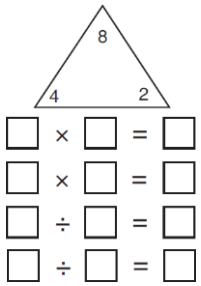
<table>
<tr>
<td>2, 5 and 10 times tables</td>
<td>Use cubes, counters, objects to make equal groups of 2. Find the total.
 
</td>
<td>Bar models , number lines and pictures to represent 2 times table calculations.
<table>
<tr><td colspan="5">10</td></tr>
<tr><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr>
</table>
2+2+2+2+2 = 10
5 x 2 = 10
 

2+2+2+2+2+2+2 =14
7 x 2 = 14

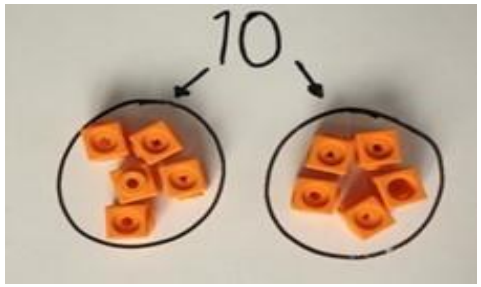
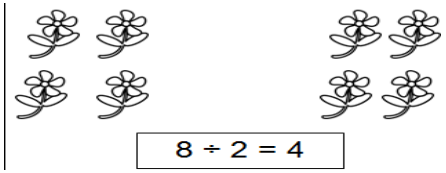
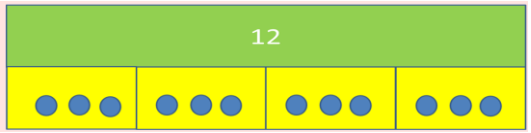
□ × □ = □</td>
<td>5 x 2 = 10
3 x □ = 6
□ x 2 = 14

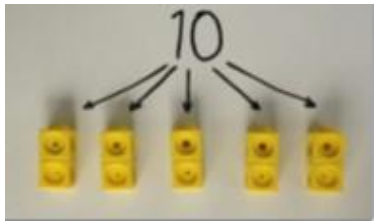
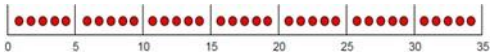
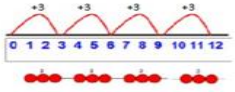
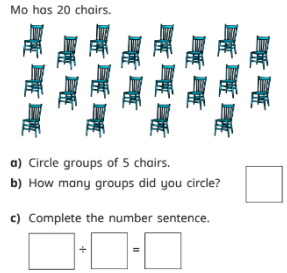
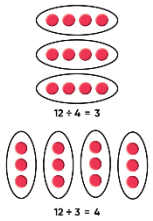
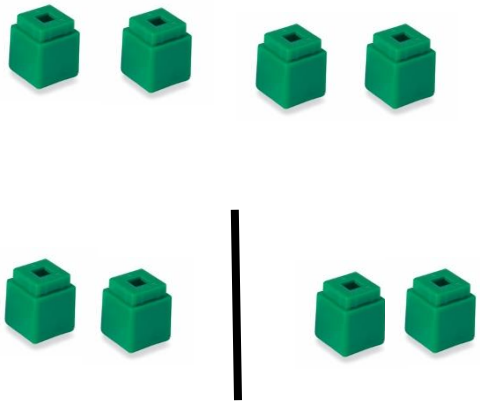
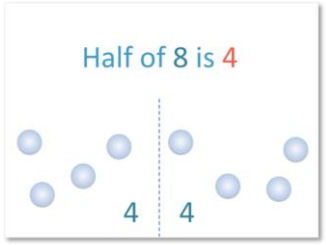
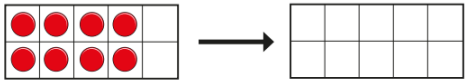
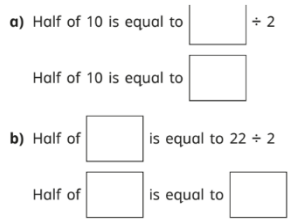
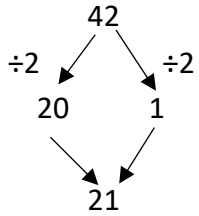
3 x 2 + 7 x 2 = 20
Find different ways to make 20.
□ × □ + □ × □
□ × □ + □ × □
□ × □ + □ × □</td>
</tr>
<tr>
<td>Making the link between the 5 and 10 times tables</td>
<td>Make the 5 times table and 10 times table using tens frames and counters. Explore what is discovered. What numbers are in both?
  </td>
<td>Use the 100 square to find patterns.
3 Here is a grid showing numbers from 51 to 100
<table>
<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>
a) Colour the numbers that are in the 10 times-table.
b) Circle the numbers that are in the 5 times-table.
What do you notice?
<table>
<tr><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td></tr>
<tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>20</td></tr>
</table>
What numbers are in both?</td>
<td>a) 3 × 10 = □ × 5
b) □ × 10 = 2 × 5
c) 5 × 10 = □ × 5
d) □ × 10 = 12 × 5</td>
</tr>
</table>

Doubling	Model doubling using dienes, objects and counters. 	Which pictures show doubles? 	Double 3 is equal to 3+3 Double 3 is equal to 2x3 Double 3 makes 6. Doubling a larger number: Partition a number and then double each part before recombining it back together. 
Odd and even numbers	Use counters on 10s frames to make odd and even numbers.  Use numicon to show odd and even numbers. 	Use a 100 square to mark on the odds and evens. Identify patterns. 	Mo is making a number pattern. ☐, 5, 7, 9, 11, 13, 15, ☐, ☐ **a)** Write the missing numbers. **b)** Write 2 numbers greater than 30 that could be in the pattern. ☐ ☐ **c)** Write 2 numbers greater than 60 that could **not** be in the pattern. ☐ ☐

Using the Inverse *This should be taught alongside division, so pupils learn how they work alongside each other.*		 	2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8÷ 2 Show all 8 related fact family sentences.

Division ÷ Year 2

Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing Focused teaching on division by 2,5,10.	 I have 10 cubes, can you share them equally in 2 groups? 10 ÷ 2= 5 Use objects to physically sharing out between people.	Children use pictures or shapes to share quantities.  Children use bar modelling to show and support understanding.  12 ÷ 4 = 3	12 ÷ 4 = 3 16 ÷ □ = 8 □ ÷ 2 = 4

Division as grouping Focused teaching on division by 2,5,10.	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. 10 ÷ 2 = 5  35 ÷5 = 7  	Use number lines for grouping  12 ÷ 3 = 4 Use pictures to help make equal groups.  Using arrays  	28 ÷ 7 = 4 24 ÷ ☐ = 12 Divide 28 into 7 groups. How many are in each group?
Halving	Model halving using dienes, objects and counters. 	Use pictures to divide in half.  Draw the counters to show half. 	 Halving bigger numbers.  Recombine to make the answer.