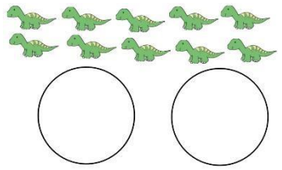
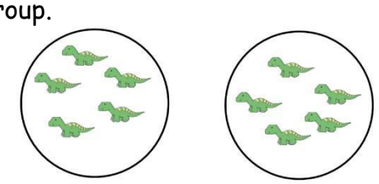
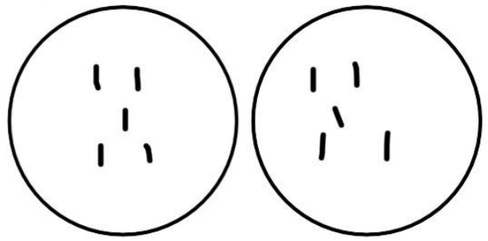
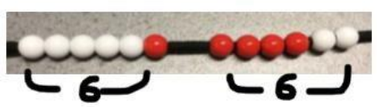
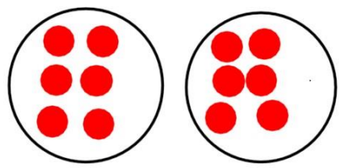
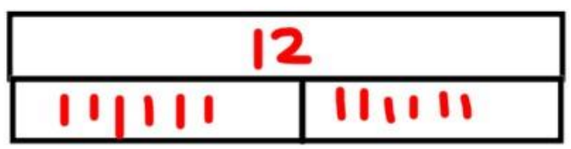
Foundation Stage

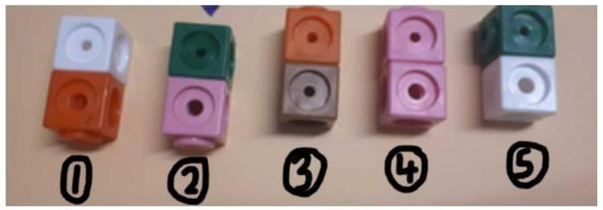
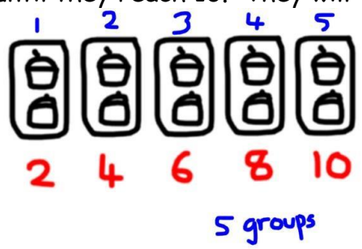
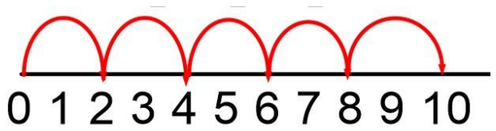
Key Vocabulary: *sharing, halving, number patterns*

Objective & Strategy	Concrete	Pictorial	Abstract
To begin to divide by sharing.	Children will understand equal groups and explore problem solving involving division through play. Children will start with an even number and will share this out equally in a given group. **Step 1:** Count how many you have. **Step 2:** Share the objects equally one at a time so that each group has the same amount. **Step 3:** Count how many are in each group. There are 10 dinosaurs and I want to share them into two groups.  There will be 5 in each group. 	Children will begin to represent their understanding of sharing pictorially. They will share 10 one at a time between the two groups. 	Children will begin to record division calculations as a number sentence. 10 ÷ 2 = 5 Children will begin to count in 2s and 10s. 2, 4, 6, 8, 10, 12 10, 20, 30, 40, 50

Year 1

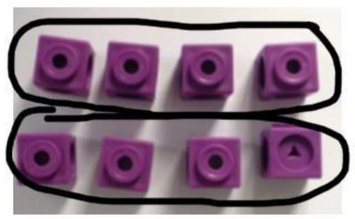
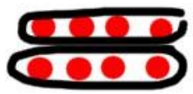
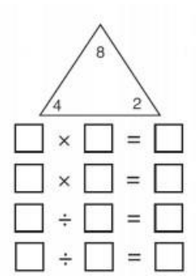
Key Vocabulary: *division, divide, dividing, grouping, sharing, halving, array, number pattern, equal grouping, equal sharing*

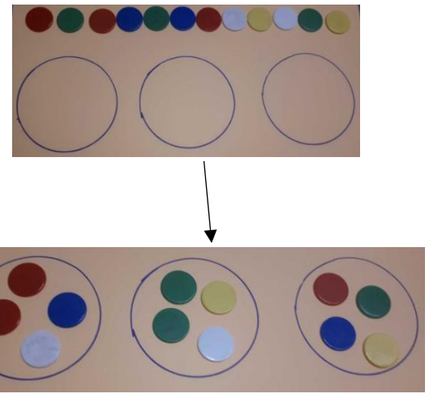
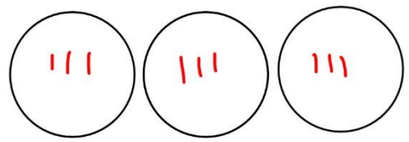
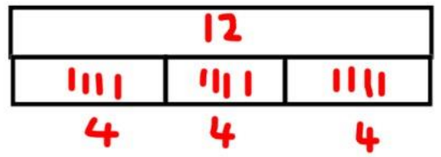
Objective & Strategy	Concrete	Pictorial	Abstract
To divide by sharing. The children know the number of groups and the total number of objects but need to find out how many are in each group. To half a number up to 20.	Children will use concrete resources to share the amount into equal groups. Children will also be able to halve a number up to 20 by sharing into equal groups. **Find half of 12.** 6 6  	Children will create their own pictorial representation of a division calculation. They will share 12 dots between two circles. **12 ÷ 2 = 6**  They will begin to represent problems in a bar model. **12 ÷ 2 = 6**  	Children will be introduced to word problems to solve division calculations. *There are 12 chocolates in the box. They are shared between Mary and her friend. How many chocolates would they get each?*

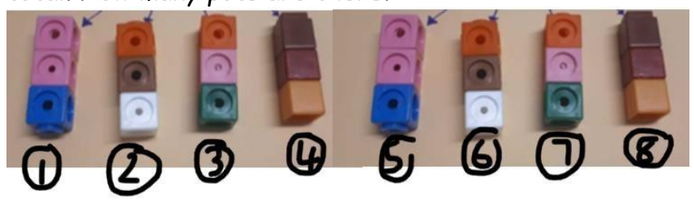
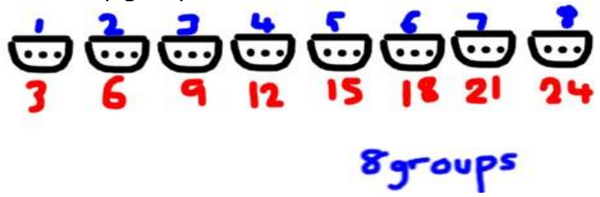
To divide by grouping (repeated addition). *In an equal group problem, children know the number of objects each group should have and the total number of objects you start with. Children need to find out how many (equal) groups can be created*	Children will begin to solve division word problems which require grouping objects into 2s, 5s and 10s. Children will use concrete resources such as cubes, counters or objects to aid understanding. *John is making boxes of cupcakes to sell. Each box will have two cupcakes in it. He has baked 10 cupcakes. How many boxes does he need?*  *He will need 5 boxes.*	Children will create their own pictorial representation of a division calculation. They understand there are two cupcakes in each box so will count in 2s until they reach 10. They will then count the number of groups.  Children will learn to use a pre-marked number line to show grouping. They count in 2s to 10 then count the number of jumps to calculate how many groups. **10 ÷ 2 = 5**  	*There are 10 flower bulbs. Plant 2 in each pot. How many pots are there?* *'There are 2, 4, 6, 8, 10 pots.'* *10 ÷ 2 = 5* *There are 10 flower bulbs. Plant 5 in each pot. How many pots are there?* *'There are 5, 10 pots.'* *10 ÷ 5 = 2*

Year 2

Key Vocabulary: *multiplication, multiply, multiplied by, multiple, grouping, doubling, array, row, column, groups of, times once, twice, three times … ten times, repeated addition, one each, two each, three each … ten each, equal groups of, multiplication table, multiplication fact.*

Objective & Strategy	Concrete	Pictorial	Abstract
To use related multiplication and division facts using the inverse for the 2, 3, 5 and 10 times table.	Children will use concrete resources to represent arrays (rectangles). These will then form part of the learning process to explain number related facts and begin to write these in number form.  4x2=8 8÷2=4 2x4=8 8÷4=2	Children will use pictorial representations to solve missing number facts that demonstrate related facts.  4x2=8 8÷2=4 2x4=8 8÷4=2	Children will write statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. They will show related number sentences to demonstrate related facts. 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 

To divide quantities by sharing. *The children know the number of groups and the total number of objects but need to find out how many are in each group.*	Children use a range of concrete resources to share quantities into equal groups. *I have 12 cubes. Can you share them equally into 3 groups?*  *There are 4 in each group.*	Children will create pictorial representations to explore their understanding of sharing. They understand that 12 needs to be shared between three groups so will draw 3 circles and make marks in each circle until they reach 12. **12 ÷ 3 = 4**  Children will also be able to use the bar model to show and support their understanding. **12 ÷ 3 = 4** 	Children will record division calculations as number sentences. 12 ÷ 3 = 4 Children will solve division word problems. *There are 12 children in the class. They are put into three groups. How many children are in each group?*

To divide by grouping (repeated addition). . *In an equal group problem, children know the number of objects each group should have and the total number of objects you start with. Children need to find out how many (equal) groups can be created.*	Children will begin to solve division word problems which require sorting objects into 2s, 3s, 4s, 5s and 10s. Children will use concrete resources such as cubes, counters or objects to aid understanding of multiplication as repeated addition. *There are 3 seeds in each pot. There are 24 seeds in total. How many pots are there?*  *There are 8 pots.*	Children will create their own pictorial representation of a division calculation. They understand that there are three seeds in each pot so will count in 3s until they reach 24. They would then count how many groups.  3 + 3 + 3 + 3+ 3 + 3 + 3+ 3 =24 Children will draw their own number line to show grouping. They would count in 3s to 24 then count the number of jumps to calculate how many groups. There are 8 groups.	Children will solve division word problems involving grouping. *There are 3 seeds in each pot. There are 24 seeds in total. How many pots are there?* *24 ÷ ? = 3* *There are 4 seeds in each pot. There are 24 seeds in total. How many pots are there?* *24 ÷ ? = 4*

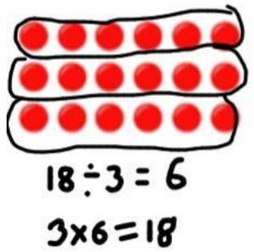
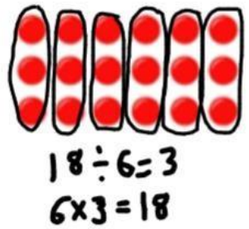
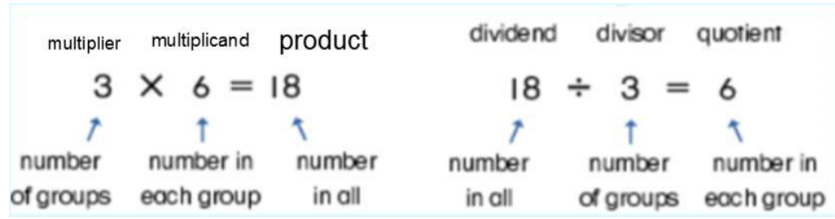
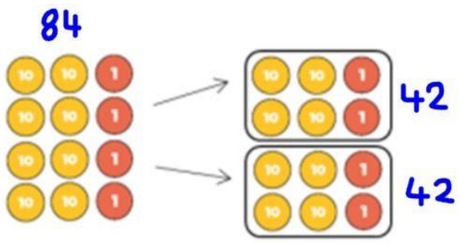
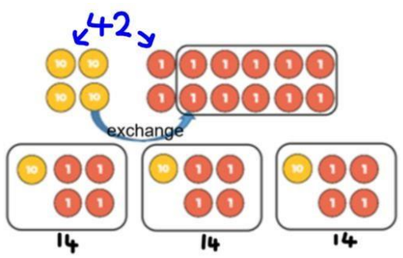
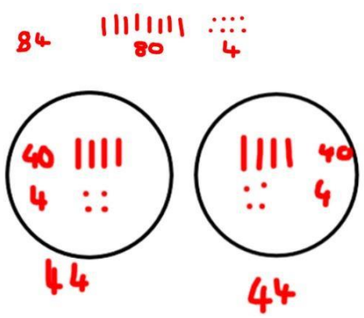
Year 3

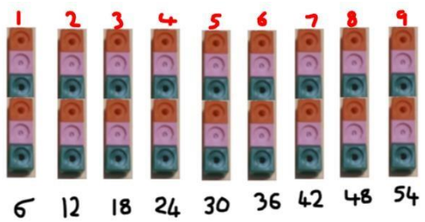
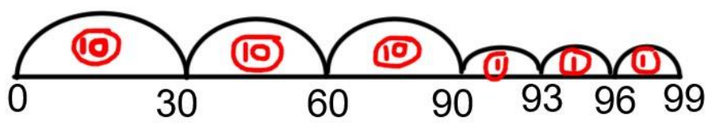
Key Vocabulary: *groups of times, repeated addition, division, dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of, halving, array row, column, number patterns, division facts*

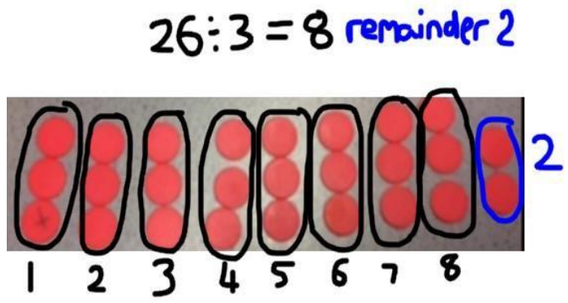
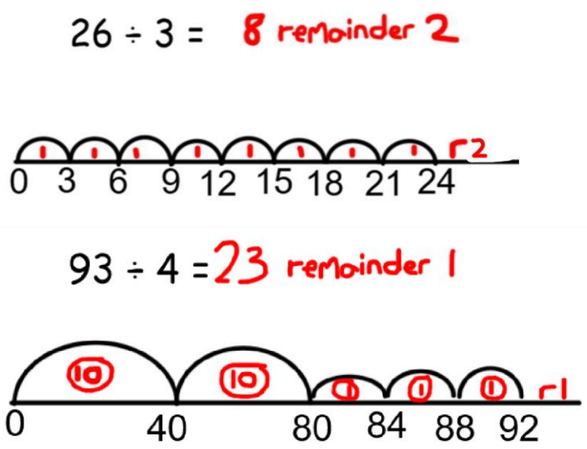
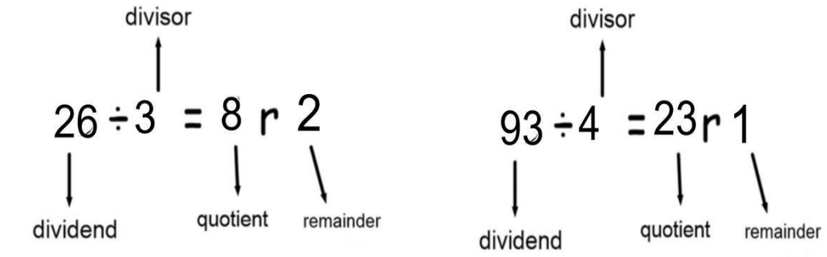
Mental strategies

Skill	Strategy
To recall related division facts for the 2, 3, 4, 5, 6, 8 & 10 times tables.	Children will use their knowledge of their times tables to find related division facts. **48 ÷ 6** 6x**8**=48 so 48 ÷ 6= **8** **24 ÷ ☐ = 3** 3x**8**=24 so for 24 ÷ ☐ = 3 the missing box is **8**.
Divide a multiple of 10 by a one-digit or tens number	Children will apply their knowledge of related division and multiplication facts to multiples of 10. **60 ÷ 3** Children make the number ten times smaller so **60** becomes **6** then divide **6**÷ 3= **2**. They then make the answer ten times bigger so 60÷ 3=**20** **320 ÷ ☐ = 40** Children use their knowledge that 32÷ **8** = 4 to solve 320 ÷ **8** = 40 so the missing box is 8.
Halves of numbers to 50.	**Half of 24** Children will partition 24 and halve each part. Half of 20 is 10 and half of 4 is 2. They then recombine 10 + 2 = 12 so half of 24 is 12. **Half of 32** Children will partition 32 and halve each part. Half of 30 is 15 and half of 2 is 1. They then recombine 15 + 1 = 16 so half of 32 is 16.
Divide a number by 3, 4, 5, 6 or 8 to give a 'teens' answer.	Children use their knowledge multiplication facts to count on and divide number outside known times tables. **42 ÷ 3** 12 x 3 = 36 so children count on in 3s from 36 until they reach 42 so 39 (13x3), **42** (14x3) so **42** ÷ 3= 14.

Year 3 Calculation Methods

Objective	Concrete	Pictorial	Abstract
To recall multiplication and related division facts for multiplication tables up to 12x 12.	Children continue to deepen their understanding of the link between multiplication and division and use physical objects to find related facts. 3 x 6= 18 18 ÷ 3 = 6 6 x 3 = 18 18 ÷ 6 = 3 	Children represent an array pictorially then find the associated multiplication and division facts by sorting into equal groups.  	Children apply their understanding of inverse relationships to write related multiplication and division statements. 3 x 6 = 18 18 = 3 x 6 6 x 3 = 18 18 = 6 x 3 18 ÷ 3 = 6 6= 18 ÷ 3 18 ÷ 6 = 3 3= 18 ÷ 6 They use associated vocabulary correctly and know what each number represents in the calculation. 
To divide a 2-digit by a 1-digit number by sharing. *The children know the number of groups and the total number of objects but need to find out* ***how many are in each group.***	Children use concrete resources to share quantities into equal groups. Children partition the dividend into tens and ones and share into equal groups as shown by the divisor. They begin by dividing numbers that do not involve exchange or remainders. It is important that children divide the tens first and then the ones. **84 ÷ 2 = 42**  They then divide numbers that involve exchanging between the tens and ones. Children share the tens between the three groups first. There is one ten that does not fit into a group so children exchange the remaining ten for ten ones. They then share the ones between the groups. **42 ÷ 3 = 14** 	Children will create pictorial representations to explore their understanding of sharing. They understand that 84 needs to be shared equally between two groups. They will draw 2 circles and represent the tens and ones until they reach 84. **84 ÷ 2 = 42** 	Children will record division calculations as number sentences. **84 ÷ 2 = 42** **42 ÷ 3 = 14** Children will solve division word problems. *Daniel thinks that 42 sweets can be shared equally between three people. Is he correct?*

To divide a 2digit by a 1-digit number by grouping (repeated addition). *The children know the <u>number of objects each group should have</u> and the <u>total number of objects</u> you start with. Children need to find out **how many (equal) groups** can be created.*	Children will begin to solve division calculations including word problems which require sorting objects into 2s, 3s, 4s, 5s, 6s and 8s. Children will use concrete resources such as cubes, counters or objects to count in groups of the divisor. *A farmer has 54 eggs and wants to put them into boxes of 6. How many boxes would he need?*  *He would need 9 boxes.*	For **54÷6**, children use a number line to count on in single jumps of the divisor (6) from 0 until they reach 54. They label each jump as 1. They then count the number of jumps to calculate the number of groups. There are 9 jumps of 1 so 54 ÷ 6 = 9 For larger numbers, children make larger jumps. Rather than counting in single jumps, they jump in groups of 10. For **99÷3**, it would take a long time to jump in single jumps of 3 so children would jump in 30s as far as they can go and label these as 10 because it is a jump of 10 groups of 3 (30). They then jump in single jumps of 3 until they reach 99. They label these as 1 as these are only single jumps. It is important to label each jump so that children can find the total correctly.  10 + 10 + 10 + 3 + 3 + 3 = 33 99 ÷ 3 = 33	Children will solve division word problems and missing box questions. *There are 54 counters. Each child in the classroom has 6 counters. How many children are in the class?* 54 ÷ ☐ = 6 *How many cars can I make if I have 88 wheels?* 88 ÷ ? = 4

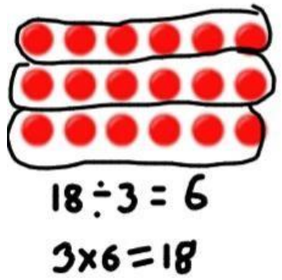
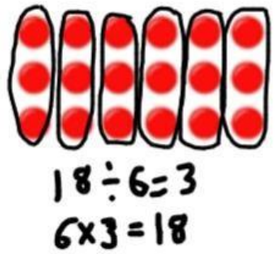
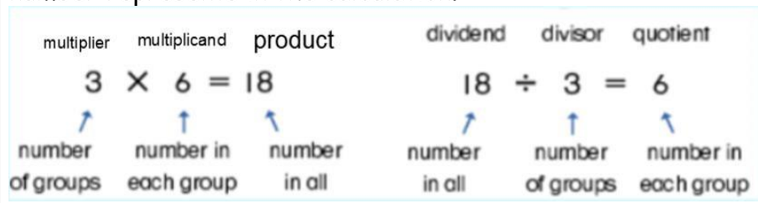
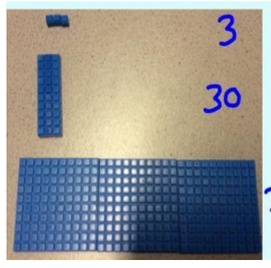
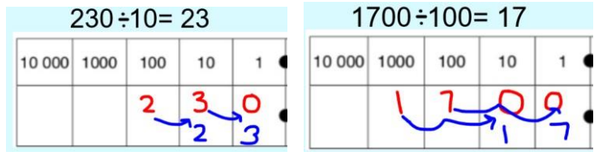
To divide 2-digit by a 1-digit number and represent any remainders.	Once children are secure in using the number line, they then explore division calculations involving remainders.  Eight whole groups can be made and there are two counters that do not make a compete group. These are called remainders.	Children will build upon their skills in using a number line to solve division calculations but with those involving remainders. The children will use the same method as mentioned above but will identify remainders (those that do not complete a whole group). 	Children will record divisions as number sentences which show the remainders.  Children will apply their understanding of remainders to the context of word problems. *Megan has 34 sweets. She shares them equally between her 3 friends. How many sweets will them each get?* 34 ÷ 3 = 11 r 1 Each child needs an equal number of sweets so each friend will get 11 sweets and there will be one left over that nobody gets.

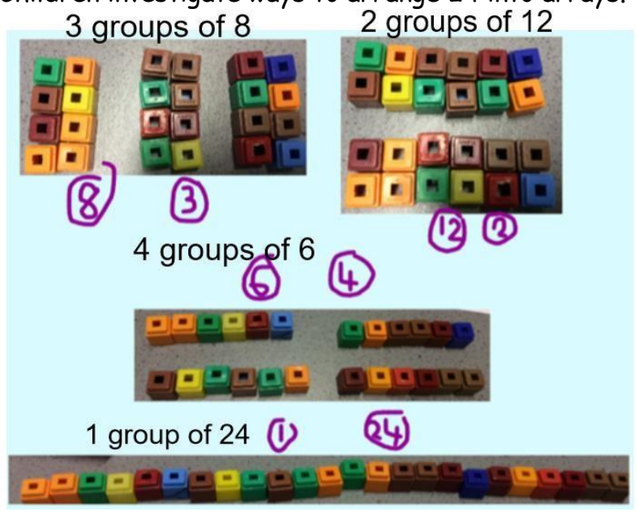
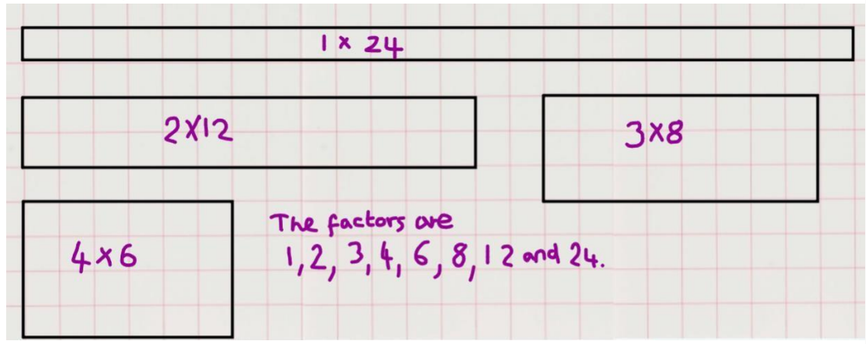
Year 4

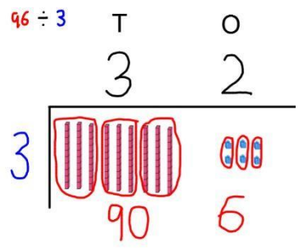
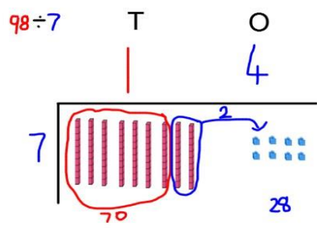
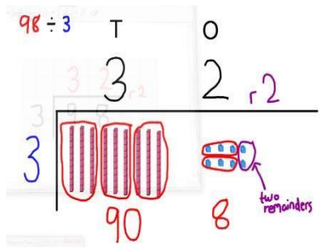
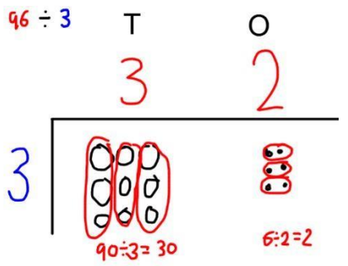
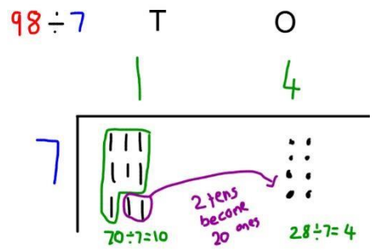
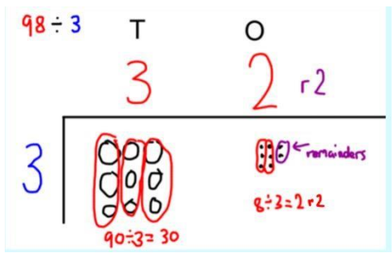
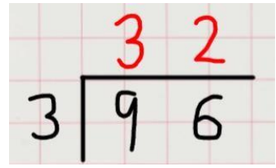
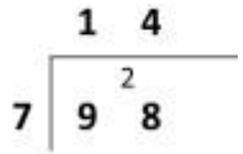
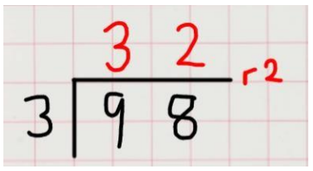
Key Vocabulary: *factors, multiples, groups of, share, share equally, equal groups, division, divide, divided by, divided into, left, left over, remainder, array.*

Mental strategies

Skill	Strategy
To recall related division facts for the times tables up to 12 x 12.	Children will use their knowledge of their times tables to find related division facts. **96 ÷ 12** 12x**8**=96 so 96 ÷ 6=12= **8** **121 ÷ ☐ = 11** 11x**11**=121 so for 121 ÷ ☐ = 11 the missing box is **11**.
To divide multiples of 10 using times table facts.	840 ÷ 70 Children make both numbers ten times smaller so 84÷7= 12 and then use this fact to help them solve 840 ÷ 70=12 540 ÷ 6 Children make the dividend (540) ten time smaller so 54÷6= 9 then make the product 10 times larger so 540 ÷ 6=90 560 ÷ ? = 80 Children make both numbers ten times smaller, 8x**7**=56 so 56÷ **7** = 8 so 560 ÷ **7** = 80, the missing box is **7**.
To divide multiples of 100 using times table facts.	2100 ÷ 7 Children make the dividend (2100)one hundred times smaller so 21÷7= 3 then make the product one hundred times bigger so 2100 ÷ 7=300 3600 ÷ 400 Children make both numbers one hundred times smaller so 36÷4= 9 to help them solve 3600 ÷ 400 =9 8100 ÷ = 900 Children make both numbers one hundred times smaller, 9x**9**=81 so 81÷ **9** = 9 then make the answer 100 times bigger so 8100 ÷ **9** = 900, the missing box is 9.
Halves of corresponding doubles to 50.	**Half of 64** Children will partition 64 and half each part. Half of 60 is 30 and half of 4 is 2. They then recombine 30 + 2 = 32 so half of 64 is 32. **Half of 72** Children will partition 72 and half each part. Half of 70 is 35 and half of 2 is 1. They then recombine 35 + 1 = 36 so half of 72 is 36.
To halve multiples of 10 and 100.	Children use their knowledge of halving and apply to multiples of 10 and 100. Half of 340 Children make the number ten times smaller so half of 34 is 17 and then make the product ten times bigger so half of 340 is 170. Half of 5600 Children make the number one hundred times smaller so half of 56 is 28 and then make the product one hundred times bigger so half of 5600 is 2800.
Divide a tens number by a one-digit or tens number	Children apply their knowledge of related division and multiplication facts to multiples of 10 **60 ÷ 3** Children make the number ten time smaller so **60** becomes **6** then divide **6**÷ 3= **2**. They then make the answer ten times bigger so 60÷ 3=**20** **320 ÷ ? = 40** 4x**8**=32 so 32÷ **8** = 4 so 320 ÷ **8** = 40, the missing box is 8.
Divide a number by any times tables up to 12x12 to give a 'teens' answer.	Children use their knowledge multiplication facts to count on and divide number outside the known times tables. **105 ÷ 7** 12 x 7 = 84 so children count on in 7s from 84 until they reach 105 so 91 (13x7), 98 (14x7), 105 (15x7) so 105 ÷ 7= 15.

Objective & Strategy	Concrete	Pictorial	Abstract
To recall multiplication and division facts for multiplication tables up to 12x 12.	Children continue to deepen their understanding of the link between multiplication and division and use physical objects to find related facts. 3 x 6= 18 18 ÷ 3 = 6 6 x 3 = 18 18 ÷ 6 = 3 	Children represent an array pictorially then find the associated multiplication and division facts by sorting into equal groups.  	Children apply their understanding of inverse relationships to write related multiplication and division statements. 3 x 6 = 18 18 = 3 x 6 6 x 3 = 18 18 = 6 x 3 18 ÷ 3 = 6 6= 18 ÷ 3 18 ÷ 6 = 3 3= 18 ÷ 6 They use associated vocabulary correctly and know what each number represents in the calculation. 
To divide whole numbers by 10 and 100.	Children use resources to understand what 10 and 100 times bigger/smaller looks like.  3 is ten times smaller than 30. 30 is ten times smaller than 300. 3 is one hundred times smaller than 3.	Children use place value grids to divide numbers by 10 and 100. They understand the movement of the digits to the right on the place value grid. **Dividing** ÷ 10 digits move RIGHT **1** space ÷ 100 digits move RIGHT **2** spaces 230 ÷10= 23 1700 ÷100= 17 	Children apply their knowledge of place value to divide numbers by 10 and 100. This includes missing box number sentences. 3450÷ 10 = 345 2300 ÷100= 23 670 ÷ ☐ = 67 ☐ ÷ 100 = 56

To recognise and use factor pairs and commutativity in mental calculations. *Factors are number which divide into another number without any remainders.*	Children understand multiplication as an array and use physical objects to create arrays to support their understanding of factors. **Factors of 24** Children investigate ways to arrange 24 into arrays.  	Children investigate finding the factors of a number by drawing arrays. Children are encouraged to work systematically to find all factors. **Factors of 24**  	Children use their knowledge of multiplication and division facts to find the factors pairs of numbers. They work systematically to find all solutions. **Factors pairs of 24** **1** x **24** = 24 **2** x **12**= 24 **3** x **8** = 24 **4** x **6** = 24 **Factors of 24:** 1, 2, 3, 4, 6, 8, 12, 24

To use a formal written method of short division (bus stop method). 2/ 3 digit ÷ 1-digit number (no exchange). 2/ 3 digit ÷ 1-digit number (with exchange). 2/ 3 digit ÷ 1-digit number (with remainders).	Children represent division calculations using concrete materials such as base 10 and place value counters. Children start by exploring division calculations with no remainders. **96 ÷ 3= 32** The children make the dividend (96) with resources and partition into tens and ones. They split the tens into 3 groups to make 30 (3 tens) then split the ones into 3 groups to make 2. The quotient is recorded on the top line (32).  They then begin to solve division calculations which involve exchange. **98 ÷ 7= 14** There are 9 tens so one group of 7 tens can be made but there are two tens remaining. These are exchanged for 20 ones and combined with the 8 ones to make 28 ones. 28 ones are then shared by 7.  Children then begin to explore division calculations involving simple remainders. **98÷ 3 = 32 r2** First the 9 tens are shared between 3. The 8 ones are they shared between 3. Two groups can be created and two do not fit into a group so are called the remainders. 	Children represent division calculations using informal jottings and pictorial representations. **96 ÷ 3= 32**  **98 ÷ 7= 14**  **98÷ 3 = 32 r2** 	The children are introduced to the bus stop method as a formal written method. **96 ÷ 3= 32**  Once children have a secure understanding, they begin to solve division calculations involving exchange. **98÷ 7 = 14**  Children apply their knowledge of division to word problems and make sense of the remainders. *Arron has 98 seeds. He plants 7 seeds in each plant pot. How many pots does he need?*  He would need 33 pots as 32 pots would not be enough.

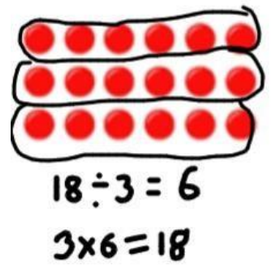
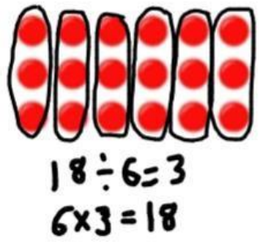
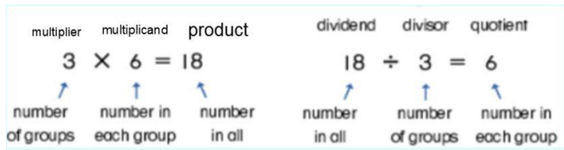
Year 5

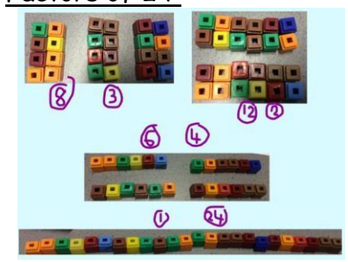
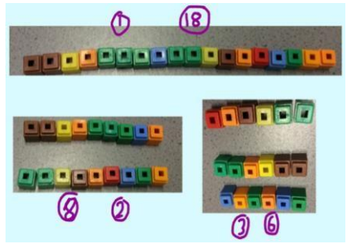
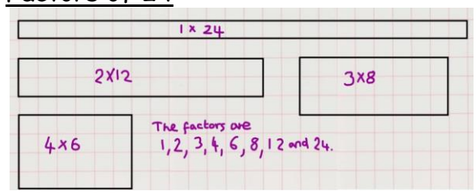
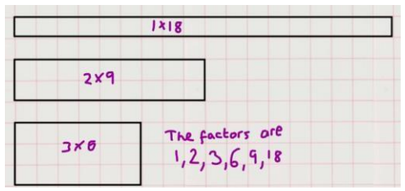
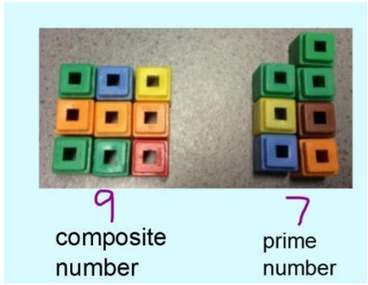
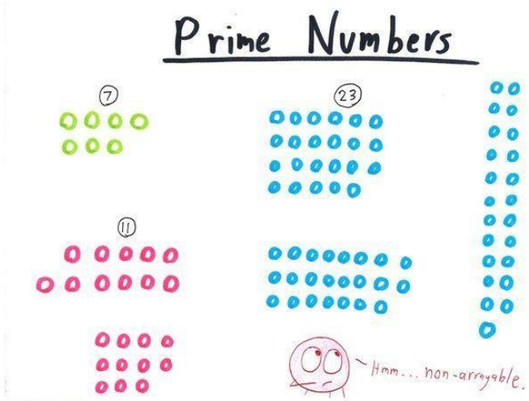
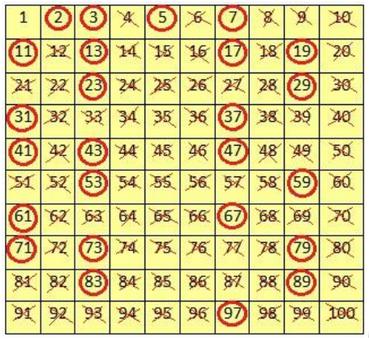
Key Vocabulary: *factors, multiples, groups of, share, share equally, equal groups, division, divide, divided by, divided into, left, left over, remainder, array, prime numbers, composite numbers.*

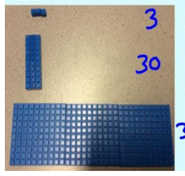
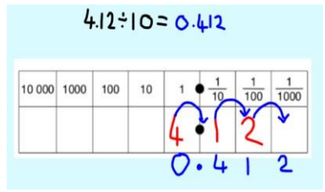
Mental strategies

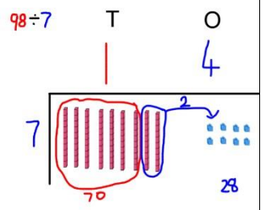
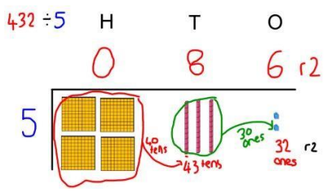
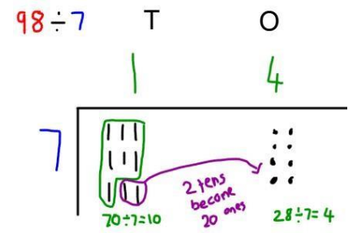
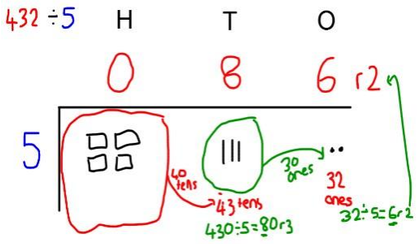
Skill	Strategy
To recall related division facts for the times tables up to 12 x 12.	Children will use their knowledge of times tables to find related division facts. **96 ÷ 12** 12x**8**=96 so 96 ÷ 6=12= **8** **121 ÷ □ = 11** 11x**11**=121 so for 121 ÷ = 11 the missing box is **11**.
To divide multiples of 10 and 100 using times table facts.	840 ÷ 70 Children make both numbers ten times smaller so 84÷7= 12 to help them solve 840 ÷ 70=12 540 ÷ 6 Children make the dividend ten times smaller so 54÷6= 9 then make the product 10 times larger so 540 ÷ 6=90 560 ÷ = 80 Children make both numbers ten times smaller, 8x**7**=56 so 56÷ **7** = 8 so 560 ÷ **7** = 80. The missing box is **7**. 2100 ÷ 7 Children make the dividend one hundred times smaller so 21÷7= 3 then make the product one hundred times bigger so 2100 ÷ 7=300 3000 ÷ 60 Children make both numbers ten times smaller so 300÷6= 50 to help solve 3000 ÷ 60=50 3600 ÷ 400 Children make both numbers one hundred times smaller so 36÷4= 9 to help solve 3600 ÷ 400 =9 8100 ÷ = 900 Children make both numbers one hundred times smaller, 9x**9**=81 so 81÷ **9** = 9 so 8100 ÷ **9** = 900. The missing box is 9.
To halve any multiple of 5 up to 500.	Children use partitioning to help them halve multiples of 5 up to 500. Half of270 Children partition 270 into 200 and 70. They halve 200 to make 100 and halve 70 to make 35 and recombine 100 + 35= 135 so half of 270= 135. Half of 168 Children partition 168 into 100, 60 and 8. They halve 100 to make 50 and halve 60 to make 30 and halve 8 to make 4. They then recombine. 50+30+4=84 so half of 168= 84.
Divide a 2 or 3-digit number by any times tables up to 12x.	Children use their knowledge multiplication facts to count on and divide number outside the times tables. They combine known facts to find their answers. **184 ÷ 8** Children first apply their knowledge of multiples of ten to get as close as they can to 184 so **20**x8=160. Then they use their knowledge within the times tables so from 160, 24 more is needed to reach 184. Children know that **3**x8=24 and **20**x8=160 and 160+24=184. To find the answer, children would count how many 8s they had counted so 20 + 3 so 184 ÷ 8= 23
Divide numbers involving remainders.	Children use their knowledge of multiples to help them find answers involving remainders. 98 ÷ 4 Children first see how close they can get to 98. They know 20x4=80 and 4x4=16. They add these numbers together so 80+16=96 (24 fours). The number 96 is 2 away from 98 so there is a remainder of 2 as no more groups of 4 are possible . 98 ÷ 4= 24 remainder 2.

Objective & Strategy	Concrete	Pictorial	Abstract

To recall multiplication and division facts for multiplication tables up to 12x 12.	Children continue to deepen their understanding of the link between multiplication and division and use physical objects to find related facts. 3 x 6= 18 18 ÷ 3 = 6 6 x 3 = 18 18 ÷ 6 = 3 	Children represent an array pictorially then find the associated multiplication and division facts by sorting into equal   groups.	Children apply their understanding of inverse relationships to write related multiplication and division statements. 3 x 6 = 18 18 = 3 x 6 6 x 3 = 18 18 = 6 x 3 18 ÷ 3 = 6 6= 18 ÷ 3 18 ÷ 6 = 3 3= 18 ÷ 6 They use associated vocabulary correctly and know what each number  represents in the calculation.

To recognise and use factor pairs of a number and find common factors of two numbers. *Factors are number which divide into another number without any remainders.*	Children use physical objects to create arrays to support their understanding of factors. They understand that common factors are factors that belong to both numbers. **Find the common factors of 18 and 24.** Factors of 24  Factors of 18  The common factors are 1, 2, 3 and 6.	Children investigate finding factors by drawing arrays to find all solutions. They then find factors which belong to both numbers. **Find the common factors of 18 and 24.** Factors of 24  Factors of 18  The common factors are 1, 2, 3 and 6.	Children use multiplication and division facts to find factors of numbers. **Find the common factors of 18 and 24** Factors of 18 Factors of 24 1 x 18 1 x 24 2 x 9 2 x 12 3 x 6 3 x 8 4 x 6 The common factors are 1, 2, 3 and 6. They solve number puzzles involving factors. This three-digit number has **2** and **7** as **factors**. 2 9 4 Write another **three-digit** number which has **2** and **7** as **factors**.
To establish whether a number up to 100 is prime and recall prime numbers up to 19. *Prime numbers are only divisible by itself and 1.*	Children find prime numbers and composite (non-prime numbers) by using arrays. They understand that composite numbers form arrays (rectangles) and prime numbers cannot be arranged into arrays, other than one long array. 	Children use jottings and pictorial representations to investigate composite and prime numbers. The numbers below are prime because you cannot form arrays and they are only divisible by itself and 1. 	Children can recall all prime numbers up to 19 off by heart. Children use their knowledge of multiples and factors to find the prime numbers up to 100. They eliminate numbers that have factors other than 1 by using their knowledge of multiples. 

To divide whole numbers and those involving decimals by 10, 100 and 1,000.	Children use resources to understand what 10, 100 and 1000 times bigger/smaller looks like.  3 is ten times smaller than 30. 30 is ten times smaller than 300. 3 is one hundred times smaller than 3.	Children use place value grids to divide numbers by 10, 100 and 1000, including decimals. They understand the movement of the digits to the right on the place value grid. **Dividing** ÷ 10 digits move RIGHT **1** space ÷ 100 digits move RIGHT **2** spaces ÷ 1000 digits move RIGHT **3** spaces  	They apply their understanding to more complex number puzzles and word problems. ☐ ÷ 10 = 0.26 ☐ ÷ 1000 = 0.054 Circle the number that is **10 times** greater than nine hundred and seven. 9,700 907 9,007 970 9,070 3450÷ 10 = 75 ÷ ☐ = 7.5 *A PS4 is on for sale at a tenth of its original price. It usually costs£450.90. How much is it at the sales?*

To use a formal written method of short division (bus stop method). Numbers up to 4 digits ÷ 1 digit number (with remainders and exchange).	Children represent division calculations using concrete resources. The children partition the dividend and put inside the bus stop then divide each part by the divisor. The quotient is then recorded on the top line. **98 ÷ 7= 14**  The children make the dividend (98) with resources and divide into tens and ones. There are 9 tens so one group of 7 tens can be made but there are two tens remaining. These are exchanged for 20 ones and combined with the 8 ones to make 28 ones. 28 ones are then shared by 7. **432÷5 = 86 r2**  There are 4 hundreds but they cannot be shared into 5 equal groups so the 4 hundreds are exchanged for 40 tens. There are now 43 tens which are shared into 5 groups. Eight groups of 5 can be made and the remaining 3 tens are exchanged for 30 ones. There are now 32 ones shared into 5 groups to give 6 equal groups. There are 2 ones left over which are recorded as remainders.	Children represent division calculations using informal jottings and pictorial representations. The children recognise remainders. **98 ÷ 7= 14**  **432÷5 = 86 r2**  	The children continue to use the bus stop method as a formal method of written calculation. 98 ÷ 7 becomes 1 4 7 | 9 8 2 Answer: 14 432 ÷ 5 becomes 8 6 r2 5 | 4 3 2 3 Answer: 86 remainder 2 Children are expected to interpret non-integar answers by expressing results as fractions $\frac{2}{5}$ (432÷5 = 86), decimals (432÷5 = 86.4) or by rounding according to the context (432÷5 = 86.4 ≈ 86 sweets). Children apply their knowledge to word problems and number puzzles. Write in the missing digit. The answer **does not** have a **remainder.** 2 6 3 | □ 8

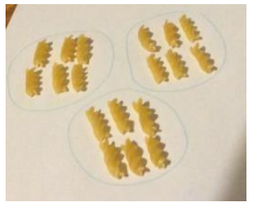
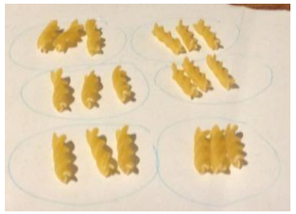
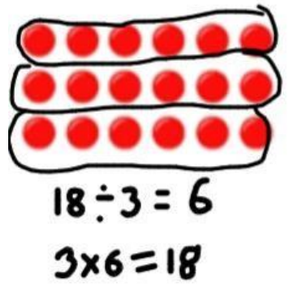
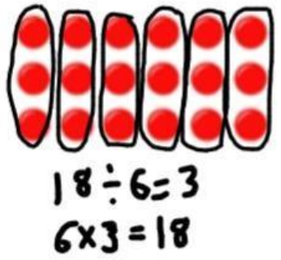
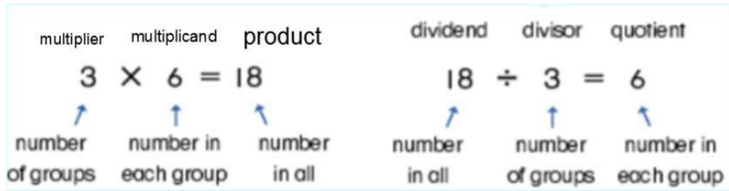
Year 6

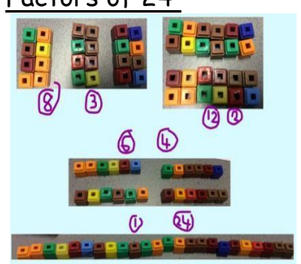
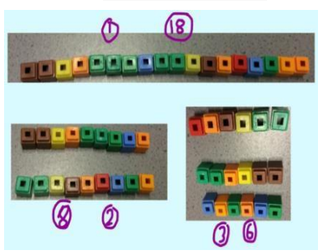
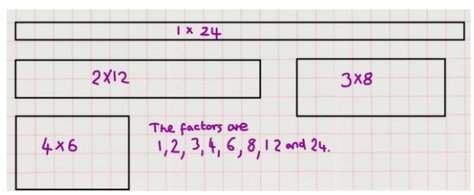
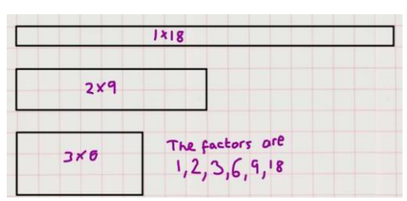
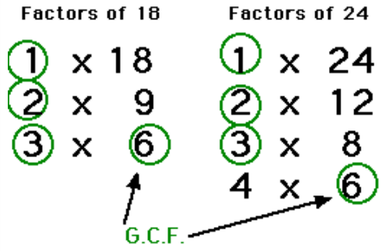
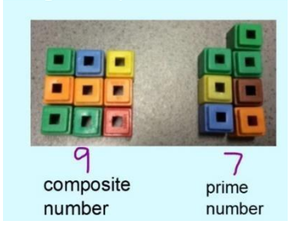
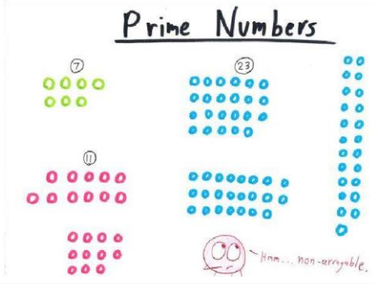
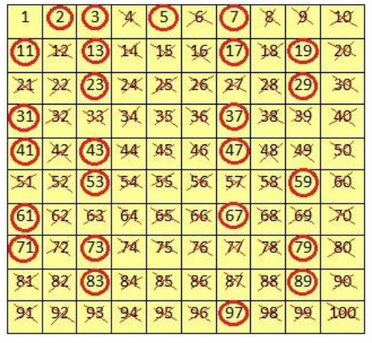
Key Vocabulary: *factors, multiples, groups of, share, share equally, equal groups, division, divide, divided by, divided into, left, left over, remainder, array.* **Mental strategies**

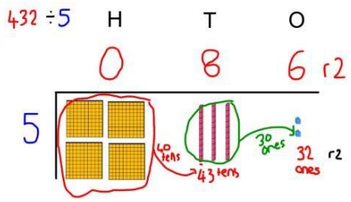
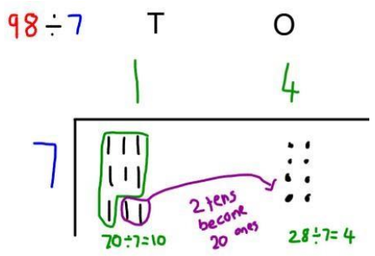
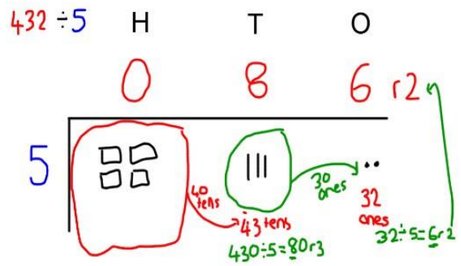
Skill	Strategy
To recall related division facts for the times tables up to 12 x 12.	Children will use their knowledge of their times tables to find related division facts **96 ÷ 12** 12x**8**=96 so 96 ÷ 6=12= **8** **121 ÷ □ = 11** 11x**11**=121 so for 121 ÷ = 11 the missing box is **11**.

To divide multiples of 10 and 100 using times table facts.	840 ÷ 70 Children make both numbers ten times smaller so 84÷7= 12 to help them solve 840 ÷ 70=12 540 ÷ 6 Children make the dividend ten times smaller so 54÷6= 9 then make the product 10 times larger so 540 ÷ 6=90 560 ÷ = 80 Children make both numbers ten times smaller, 8x**7**=56 so 56÷ **7** = 8 so 560 ÷ **7** = 80. The missing box is **7**. 2100 ÷ 7 Children make the dividend one hundred times smaller so 21÷7= 3 then make the product one hundred times bigger so 2100 ÷ 7=300 3000 ÷ 60 Children make both numbers ten times smaller so 300÷6= 50 to help solve 3000 ÷ 60=50 3600 ÷ 400 Children make both numbers one hundred times smaller so 36÷4= 9 to help them solve 3600 ÷ 400 =9 8100 ÷ = 900 Children make both numbers one hundred times smaller, 9x**9**=81 so 81÷ **9** = 9 so 8100 ÷ **9** = 900. The missing box is 9. 42000 ÷ 600=70 Children make both numbers one hundred times smaller so 420÷6= 70 to help them solve 42000 ÷ 600 =70. 45000 ÷ 50=900 Children make 45000 one hundred times smaller so 450÷50= 9 then make the product one hundred times bigger so 45000 ÷ 50 =900
To divide 3-digit numbers by any times tables up to 12x.	Children use their knowledge multiplication facts to count on and divide number outside the times tables. They combine known facts to find their answers. **184 ÷ 8** Children first apply their knowledge of multiples of ten to get as close as they can to 184 so **20**x8=160. Then they use their knowledge within the times tables so from 160, 24 more is needed to reach 184. Children know that **3**x8=24 and **20**x8=160 and 160+24=184. To find the answer, children would count how many 8s they had counted so 20 + 3 so 184 ÷ 8= 23
To divide numbers involving remainders.	Children use their knowledge of multiples to help them find answers involving remainders. 154 ÷ 4 Children first see how close they can get to 154. They know 30x4=120 and 8x4=32. They add these numbers together so120+32=152 and 38 groups of 4 have been made. The number 152 is 2 away from 154 but no more groups of 4 are possible so 154÷ 4= 38 remainder 2.
To halve decimals involving ones and tenths and decimals less than 1.	Children apply their knowledge of halving to decimal numbers to 2 decimal places. Half of 3.4 Children make 3.4 ten times bigger. They halve 34 to get 17. They then make the product 10 times smaller so half of 3.4= 1.7 Half of 0.7 Children make 0.7 ten times bigger. They halve 7 to get 3.5. They then make the product 10 times smaller so half of 0.7= 0.35
To divide decimals involving dividing tenths by a one-digit number.	3.6 ÷ 9 Children make 3.6 ten times bigger to make 36 then divide it by 9 to make 4. They then make the product ten times smaller so 3.6 ÷ 9= 0.4 4.8 ÷ = 0.6 Children make both numbers ten times bigger and use their knowledge of times table to support them. Children know 48÷8=6 so 4.8 ÷ 8 = 0.6 ÷ 7 = 0.7 Children make the quotient (0.7) ten times bigger then use their knowledge of the inverse. They know 7x 7 = 49 so 49÷7 = 7. They then need to make the product ten times smaller so 4.9 ÷ 7 = 0.7
To divide decimals involving dividing hundredths by a one-digit number.	0.18 ÷ 3 Children make 0.18 one hundred times bigger to make 18 then divide by 3 to make 6. They then make the product one hundred times smaller so 0.18 ÷ 3= 0.06 0.56 ÷ = 0.7 Children make the dividend ten times bigger and use their knowledge of times tables and dividing decimals to support them (see above). 5.6÷8=0.7. They then make the product ten times smaller so 0.56 ÷ 0.8 = 0.7
To divide a whole number by a decimal number.	Children understand that because they are dividing by a number smaller than one then more of them will fit into the number. 15 ÷ 0.3 Children make the divisor (0.3) ten times bigger so 15 ÷ 3=5 . They then make their product ten times bigger so 15 ÷ 0.3=50
To divide decimals involving dividing hundreds by a one-digit number.	Children understand that because the dividend is larger than the divisor then they will get a decimal answer. 14÷20 Children make the multiple of 10, ten times smaller so 14 ÷ 2=7. They then make their product ten times smaller so 14 ÷ 20=0.7

Objective & Strategy	Concrete	Pictorial	Abstract

To recall multiplication and division facts for multiplication tables up to 12x 12.	Children continue to deepen their understanding of the link between multiplication and division and use physical objects to find related facts. 3 x 6= 18 18 ÷ 3 = 6 6 x 3 = 18 18 ÷ 6 =3  	Children represent an array pictorially then find the associated multiplication and division facts by   sorting into equal groups.	Children apply their understanding of inverse relationships to write related multiplication and division statements. 3 x 6 = 18 18 = 3 x 6 6 x 3 = 18 18 = 6 x 3 18 ÷ 3 = 6 6= 18 ÷ 3 18 ÷ 6 = 3 3= 18 ÷ 6 They use associated vocabulary correctly and know what each number represents in the calculation. 

To identify common factors. *Factors are number which divide into another number without any remainders.*	Children use physical objects to create arrays to support their understanding of factors. They understand that common factors are factors that belong to both numbers. **Find the common factors of 18 and 24.** Factors of 24  Factors of 18  The common factors are 1, 2, 3 and 6.	Children investigate finding factors by drawing arrays to find all solutions. They then find factors which belong to both numbers. **Find the common factors of 18 and 24.** Factors of 24  Factors of 18  The common factors are 1, 2, 3 and 6.	Children use their knowledge of multiplication and division facts to find factors of numbers. **Find the common factors of 18 and 24**  The common factors are 1, 2, 3 and 6. The greatest common factor is 6.
To establish whether a number up to 100 is prime and recall prime numbers up to 19. *Prime numbers are only divisible by itself and 1.*	Children find prime numbers and composite (nonprime numbers) by using arrays. They understand that composite numbers form arrays (rectangles) and prime numbers cannot be arranged into arrays, other than one long array.  	Children use jottings and pictorial representations to investigate composite and prime numbers. The numbers below are prime because you cannot form arrays and they are only divisible by itself and 1.  	Children can recall all prime numbers up to 19 off by heart. Children use their knowledge of multiples and factors to find the prime numbers up to 100. They eliminate numbers that have factors other than 1 by using their knowledge of multiples. 

To use a formal written method of short division (bus stop method). Larger numbers ÷ 1 digit number (involving remainders)	Children represent division calculations using concrete resources. The children partition the dividend and put inside the bus stop then divide each part by the divisor. The quotient is then recorded on the top line. **98 ÷ 7= 14** The children make the dividend (98) with resources and divide into tens and ones. There are 9 tens so one group of 7 tens can be made but there are two tens remaining. These are exchanged for 20 ones and combined with the 8 ones to make 28 ones. 28 ones are then shared by 7. 98 ÷ 7 becomes 1 4 7 | 9 2 8 Answer: 14 **432÷5 = 86 r2** There are 4 hundreds but they cannot be shared into 5 equal groups so the 4 hundreds are exchanged for 40 tens. There are now 43 tens which are shared into 5 groups. Eight groups of 5 can be made and the remaining 3 tens are exchanged for 30 ones. There are now 32 ones shared into 5 groups to give 6 equal groups. There are 2 ones left over which are recorded as remainders. 	Children represent division calculations using informal jottings and pictorial representations. The children recognise remainders. **98 ÷ 7= 14**  **432÷5 = 86 r2** 	In Year 6 children divide larger numbers and decimals by a 1-digit number with calculations involving remainders. The children continue to use the bus stop method as a formal method of written calculation. 98 ÷ 7 becomes 1 4 7 | 9 2 8 Answer: 14 432 ÷ 5 becomes 8 6 r2 5 | 4 3 3 2 Answer: 86 remainder 2 **142 ÷ 4 = 35·5** 0 3 5·5 4 | 1 1 4 2 2·2 0 Children are expected to interpret non-integar answers by expressing results as fractions $\frac{2}{5}$ (432÷5 = 86), decimals (432÷5 = 86.4) or by rounding (432÷5 = 86.4 ≈ 86 sweets) according to the context. Children apply their knowledge using word problems and number puzzles. *Sharon buys a pack of 24 cans of lemonade for £6. How much does each can cost?* 70 ÷ ☐ = 3.5 25 ÷ ☐ = 3 remainder 4

To use a formal written method of long division (bus stop method).

Divide larger numbers ÷ 2 digit numbers (involving remainders).

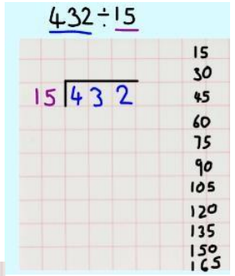
Method 1 (expanded)

This method works well if children are struggling to calculate the numbers which carry over as it works them as through subtraction.

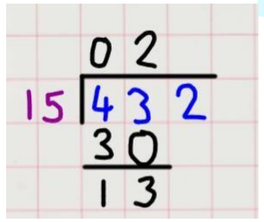
The children use the bus stop method as a formal method of written calculation. They use their understanding of the pictorial and concrete stages to understand the value of each number.

432 ÷ 15 = 28 r12

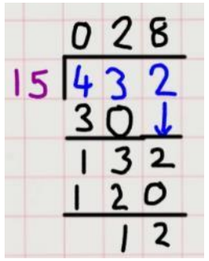
Step one: Children will put the calculation into the bus stop grid and list their multiples of the divisor.



Step 2: Start with the hundreds. The divisor divide into 4 so a zero is put above the line and combine the 4 hundreds with the 3 tens. Use the to calculate the nearest multiple. In this case is two 15s so 2 is recorded on the line above and below the 43. You then subtract 30 from 43 to make 13.



(15) doesn't you would multiples of 15 it 30 which is 30 is written



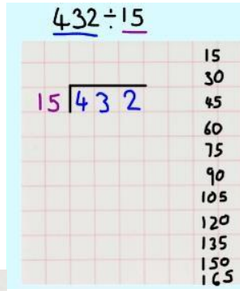
Step 3: The divisor(15) does divide into 13 so bring the 2 ones to make 132. Use the multiples of 15 to calculate the nearest multiple. 8 x 15 is 120. Record this underneath, put the 8 on the top then subtract to make 12.

Step 4: No more groups of 15 can be made so the number left is your remainder. Record this with your answer 432 ÷ 15 = 28 r12.

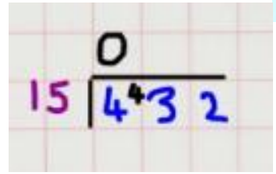
Method 2 (condensed)

For this method, children will need to be confident in holding numbers in their heads.

Step one: Children will put the calculation into the bus stop grid and list their multiples of the divisor.

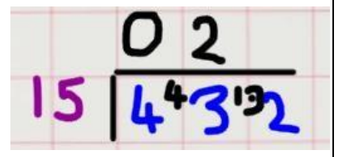


Step 2: Start with the hundreds. The divisor (15) doesn't divide into 4 so a 0 is written and the 4 is carried into the tens column to

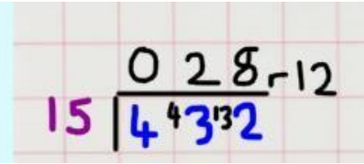
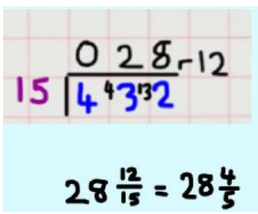
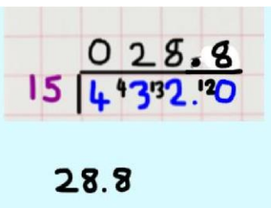
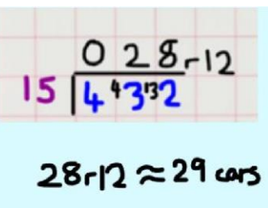


above the line make 43 (430).

Step 3: You now have 43. Calculate how many 15s are in 43 (2), write on top of the bus stop and pass the remainders (13) into the ones column.



Step 4: You now have 132. Calculate how many 15s are in 132 (8) and write the remainders (12).



When solving division calculations, children are expected to interpret non-integar answers by expressing results as fractions, decimals or by rounding according to the context.