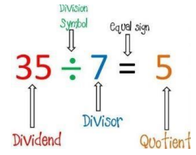
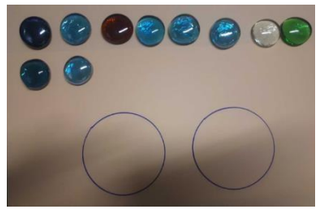
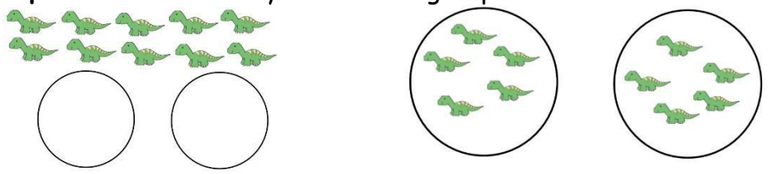
Loddington CE Primary Calculation Policy- Division



Foundation Stage

Key Vocabulary: *share, half, equal, unequal, fair, unfair, groups, each.*

Objective & Strategy	Concrete	Pictorial	Abstract
To begin to divide by sharing.	Children will use a range of concrete resources to share beginning to demonstrate understanding of equal groups. Recognise using vocabulary such as 'fair' and 'unfair' groups in context.  	Children will understand equal groups and share items out in play and problem solving. **Step 1:** Count how many you have. **Step 2:** Share them equally using 1 to each group at a time, so each group has the same amount. **Step 3:** Count how many are in each group. 	

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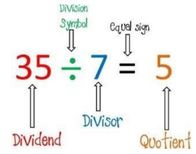
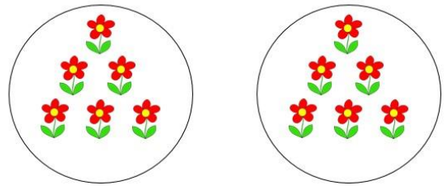
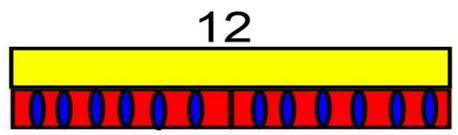
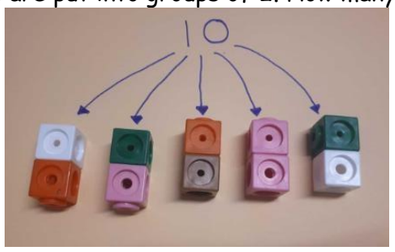
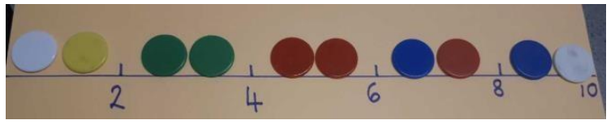
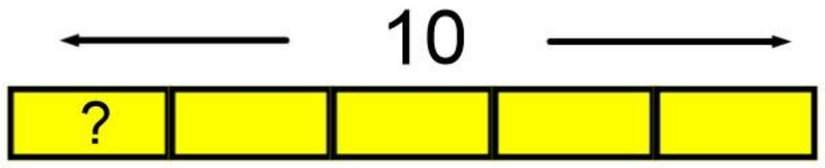


Year 1

Key Vocabulary: *division, dividing, grouping, sharing, doubling, halving, array, number pattern, equal, odd, even, dividend, divisor, quotient.*

Objective & Strategy	Concrete	Pictorial	Abstract
To divide by sharing To half a number up to 20.	Children will use concrete resources, including uni-fix cubes to share into equal groups. Children will also be able to half a number up to 20 by sharing into equal groups.   **Stem Sentence:** **12** divided equally between **2** groups equals **6 in each group.** .	Children will draw jottings and have pictorial representations to demonstrate knowledge of sharing into equal groups. 12 ÷ 2 = 6  I know there are 2 groups and in each group there are 6 flowers.  12 ÷ 2 = 6 **Stem Sentence:** **12** divided equally between **2** groups equals **6 in each group.**	Children will be introduced to simple word problems to solve division problems. 12 sweets are shared between 2 people. How many do they have each? 12 ÷ 2 = 6 **Stem Sentence:** **12** divided equally between **2** groups equals **6 in each group.**
To divide by grouping.	Children will begin to solve division problems, which require sorting objects and quantities into 2s, 5s and 10s. Children will use concrete resources such as cubes, counters or objects to aid understanding. 10 cubes are put into groups of 2. How many groups?   **Stem sentence:** **10** cubes are put into groups of **2**. There are **5** equal groups.	Children will also experiment dividing by grouping using the bar model. The children will be given a number or picture representatives. This will represent the whole. They then need to split the whole into the number of groups they are dividing by and work out how many would be in each group. 10 cubes are put into groups of 2. How many groups?  **Stem sentence:** **10** cubes are put into groups of **2**. There are **5** equal groups.	

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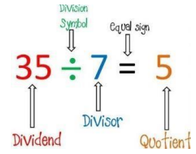
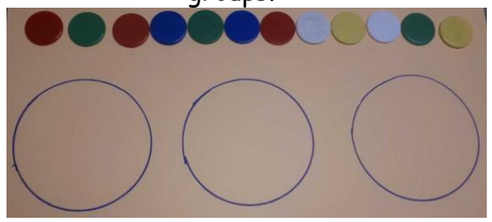
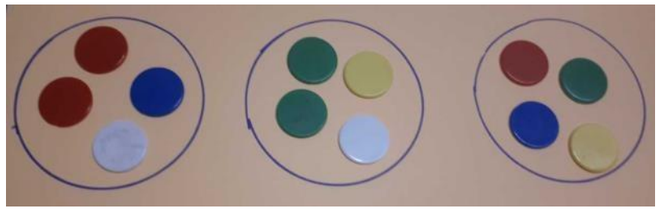
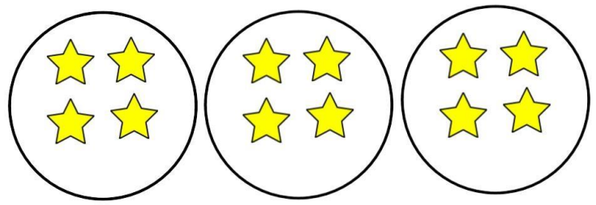
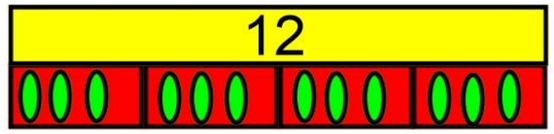


Year 2

Key Vocabulary: *division, dividing, grouping, groups of, sharing, doubling, halving, array, number pattern, equal, unequal, odd, even, dividend, divisor, quotient.*

Objective & Strategy	Concrete	Pictorial	Abstract
To divide by sharing.	Children will use a range of concrete resources, including cubes to share objects and quantities into equal groups. I have 12 cubes, can you share them equally into 3 groups?   **Stem Sentence:** **12** divided equally between **3** groups equals **4 in each group.**	Children will use pictures and shapes to share quantities. 12 ÷ 3 = 4  Children will also be able to use the bar model to show and support their understanding. e.g. 12 ÷ 4 = 3  **Stem Sentence:** **12** divided equally between **3** groups equals **4 in each group.** **12** divided equally between **4** groups equals **3 in each group.**	Children will be writing division number sentence using the divide symbol. 12 ÷ 3 = 4 12 ÷ 4 = 3 **Stem Sentence:** **12** divided equally between **3** groups equals **4 in each group.** **12** divided equally between **4** groups equals **3 in each group.**

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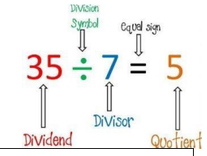
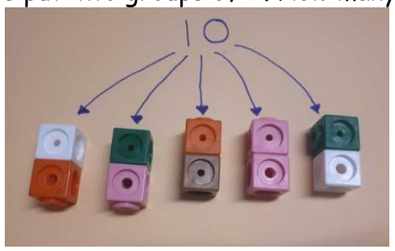
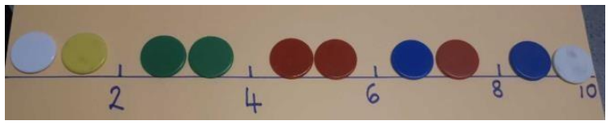
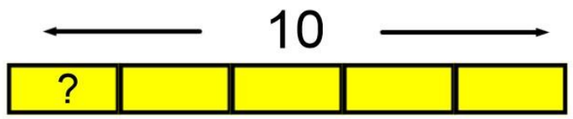


To divide by grouping.	Children will begin to solve division problems, which require sorting objects and quantities into 2s, 5s and 10s. Children will use concrete resources such as cubes, counters or objects to aid understanding. 10 cubes are put into groups of 2. How many groups?   **Stem sentence:** **10** cubes are put into groups of **2**. There are **5** equal groups.	Children will also experiment dividing by grouping using the bar model. The children will be given a number or picture representatives. This will represent the whole. They then need to split the whole into the number of groups they are dividing by and work out how many would be in each group. 10 cubes are put  are into groups of 2. How many groups? **Stem sentence:** **10** cubes are put into groups of **2**. There are **5** equal groups.	Children will use grouping to solve missing number problems e.g. 10÷ ? = 2 Stem Sentence **10** cubes are put into **?** equal groups. There are 2 in each group.

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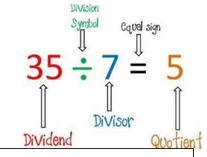
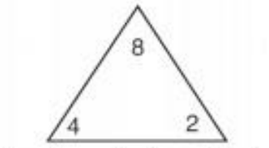
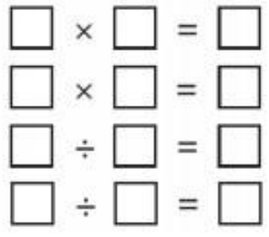
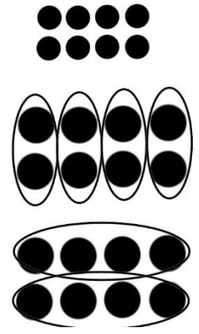
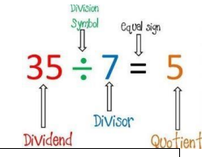


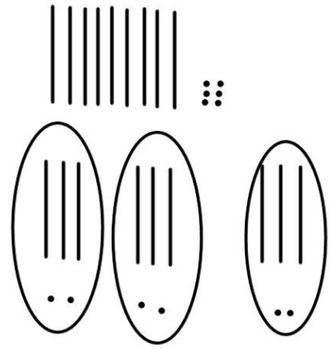
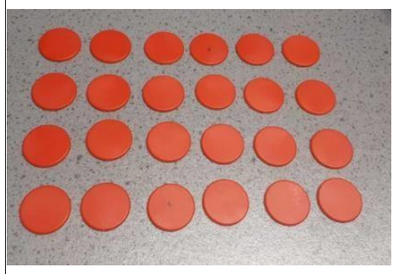
To use related multiplication and division facts using the inverse for the 2, 5 and 10 times table.	Children will use concrete resources, including cubes to represent arrays. These will then form part of the learning process to explain number related facts and begin to write these in number form. 2 x 4 =8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 	Children will use pictorial representations including arrays to solve missing number facts that demonstrate related facts.   	Children will show all 8 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

Year 3

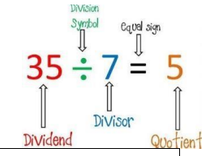
Key Vocabulary: *division, dividing, grouping, groups of, sharing, doubling, halving, array, number pattern, equal, unequal, odd, even, dividend, divisor, quotient, remainder, division fact.*

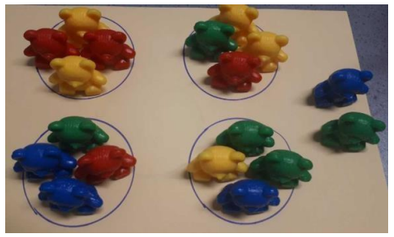
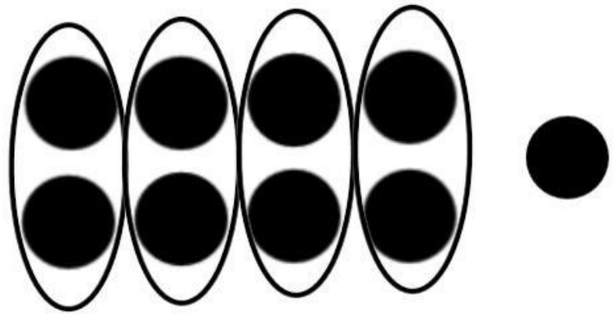
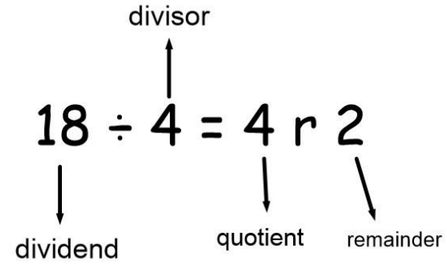
Loddington CE Primary Calculation Policy- Division



Objective	Concrete	Pictorial	Abstract
To divide 2 digit numbers by partitioning.	Children will use concrete resources, including place value counters and base ten to divide by partitioning **96÷3=** **Step 1: Partition the dividend into tens and ones** **Step 2: share the tens into equal groups as shown by the divisor.** **(If they do not divide exactly exchange the remaining tens for ones)** **Step 3: share the ones into equal groups as shown by the divisor.** **Step 4: Add the tens and ones from one group to find the quotient.**	Children will continue to use partitioning representing the base 10 pictorially **96÷3=**  Children will also continue to use the bar model to support their understanding. 96 32 | 32 | 32	There are 96 footballs. They are shared between 3 teams. How many footballs does each team get? 96 ÷ 3 = 32 **How many groups of 3 in 90? How many groups of 3 in 6?** **How many groups of 3 in 96?**
To use arrays to divide.	Children will link division to multiplication by using arrays. They will begin writing numbers sentences to show what they can create.  6 x 4 = 24 4 x 6 = 24 24 ÷ 6 = 4 24 ÷ 4 = 6	Children will draw or be given a pictorial representation of an array. They will circle the array to split it into groups to make multiplication and division sentences.  24 ÷ 6 = 4 **STEM: 4** multiplied by **6** equals **24** so **24** divided by **6** equals **4**.	Children will find the inverse of multiplication and division sentences by creating linking number sentences. 6 x 4 = 24 4 x 6 = 24 24 ÷ 6 = 4 24 ÷ 4 = 6

Loddington CE Primary Calculation Policy- Division



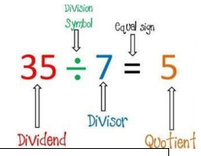
To divide with whole numbers and represent remainders.	Children will use a range of concrete resources to divide between groups and see what is left over. 18 ÷ 4 = 4 r 2   Stem Sentence: **18** divided by **4** equals **4** in each group and **2** left over. Reasoning: 18 divided by 4 must have a remainder because I know that 4x4=16 and 18 is 2 more.	Children will draw equal groups to solve division problems with remainders, understanding that groups must be equal and any others are remainders. 9÷4=2r1  **9** divided by **4** equals **2** in each group and **1** left over.	Children will complete written division number sentences using the division symbol and r to represent the remainder.  Stem Sentence: **18** divided by **4** equals **4** in each group and **2** left over.

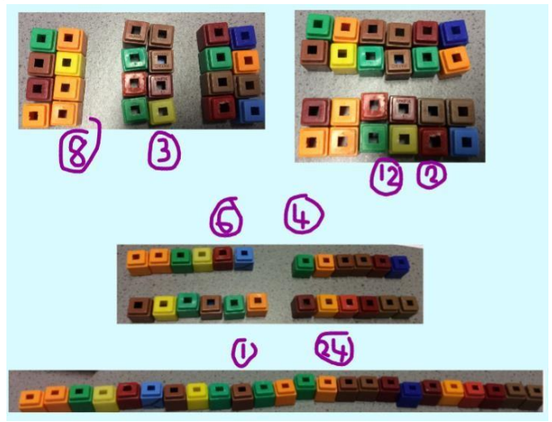
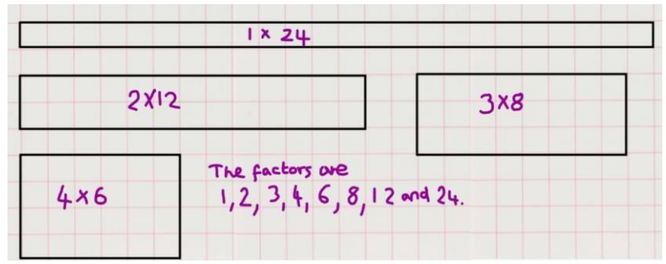
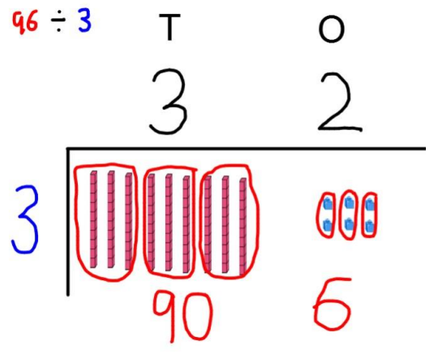
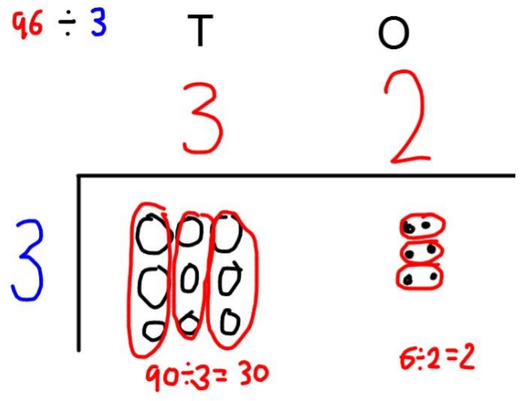
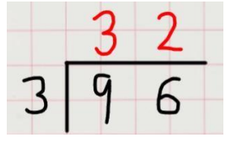
Year 4

Key Vocabulary: *factors, multiples, division, dividing, grouping, groups of, sharing, doubling, halving, array, number pattern, equal, unequal, odd, even, dividend, divisor, quotient.*

Objective & Strategy	Concrete	Pictorial	Abstract

Loddington CE Primary Calculation Policy- Division



To recognise and use factor pairs and commutativity in mental calculations.	Children use physical objects to create arrays to support their understanding of factors. **Factors of 24**  	Children investigate finding all factors of a number by drawing arrays. **Factors of 24**  	Children use their knowledge of multiplication and division facts to find factors of numbers. **Factors of 24** **1** x **24** = 24 **2** x **12**= 24 **3** x **8** = 24 **4** x **6** = 24
To use a formal written method of short division. 2/ 3 digit ÷ 1 digit number (exact answers- no remainders)	Children represent division calculations using concrete materials such as base 10 and place value counters. 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.  	Children represent division calculations using informal jottings and pictorial representations.  They begin to explore calculations involving simple remainders.	In Year 4 children divide numbers up to 3 digits by a 1 digit numbers with exact answers. The children are introduced to the bus stop method as a formal written method. **96 ÷ 3= 32** 

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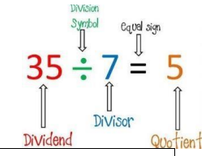
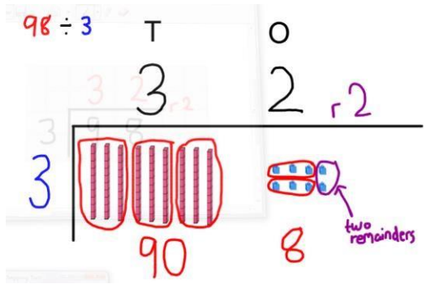
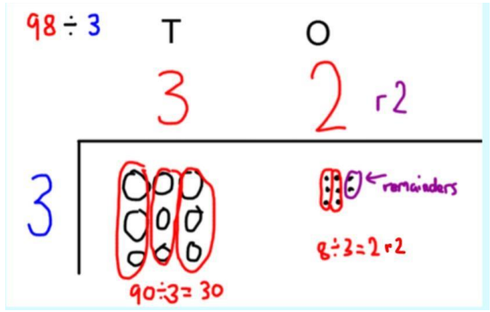
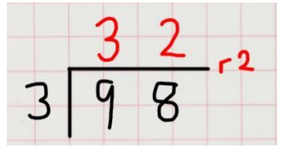


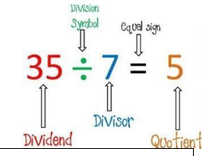
2 or 3 digit divided by a 1 digit number (simple remainders)	They begin to explore calculations involving simple remainders. **98÷ 3 = 32 r2** 	**98÷ 3 = 32 r2** 	Once children have a secure understanding, they begin to understand how to record calculations with simple remainders. **98÷ 3 = 32 r2**  Children apply their knowledge of division to word problems. *Arron has 77 seeds. He plants 4 seeds in each plant pot. How many pots does he need?*

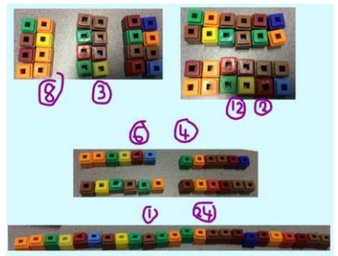
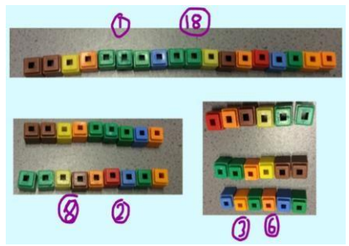
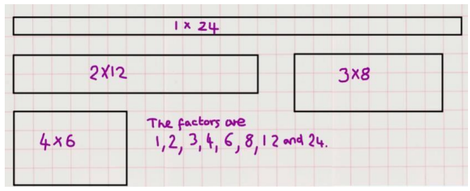
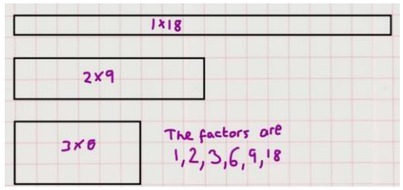
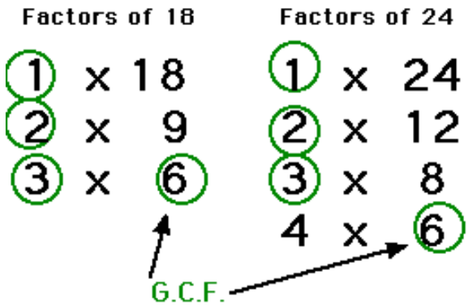
Year 5

Key Vocabulary: *factors, multiples, groups of, share, equal groups, division, divide, divided by, divided into, left over, remainder, array, prime numbers, composite numbers, grouping, groups of, sharing, doubling, halving, array, number pattern, equal, unequal, odd, even, dividend, divisor, quotient.*

Objective & Strategy	Concrete	Pictorial	Abstract

Loddington CE Primary Calculation Policy- Division



To recognise and use factor pairs of a number and find common factors of two numbers.	Children use physical objects to create arrays to support their understanding of factors. **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**  The common factors are 1, 2, 3 and 6. 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**.

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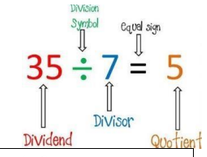
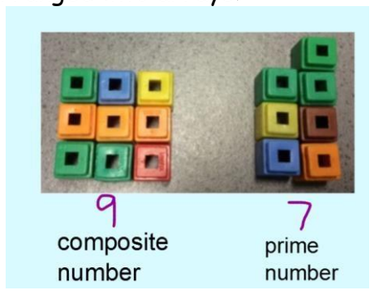
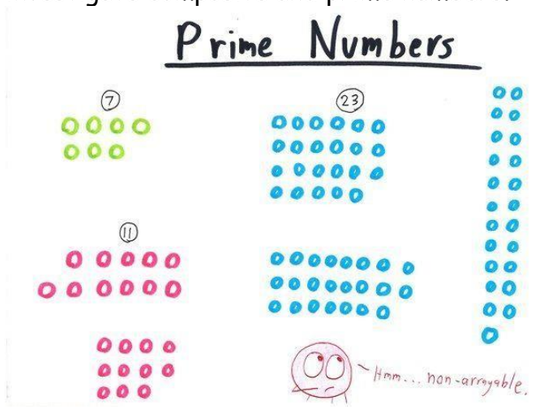
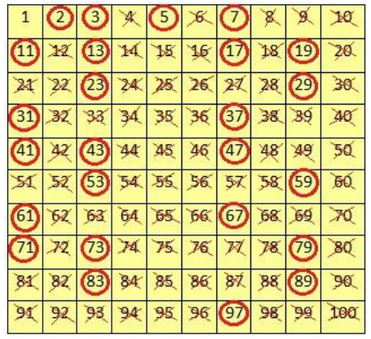
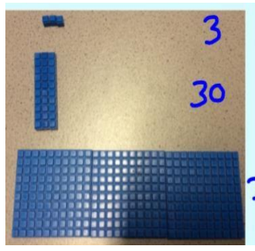
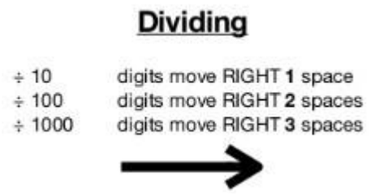
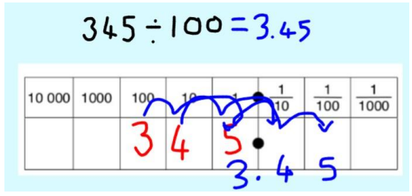
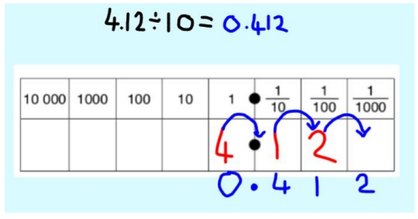


To establish whether a number up to 100 is prime and recall prime numbers up to 19.	Children find prime numbers and composite (non-prime numbers) by using arrays. They understand that composite numbers form arrays and prime numbers cannot be arranged into arrays. 	Children use jottings and pictorial representations to investigate composite and prime numbers. 	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.They can recall all prime numbers up to 19. 
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 looks like. 	Children use place value grids to divide numbers by 10, 100 and 1000s. They understand the movement of the digits on the place value grid.   	They apply this knowledge to decimal numbers.	Children apply their knowledge of place value to divide numbers by 10, 100 and 1000, including decimal numbers. 3450÷ 10 = 345 345÷100= 3.45 2.67 ÷10= 0.267 12.7÷1000= 0.0127 They apply their understanding to more complex number puzzles and word problems. Circle the number that is **10 times** greater than nine hundred and seven. 9,700 907 9,007 970 9,070 Write the missing number to make this **division** correct. 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?*

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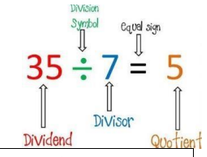
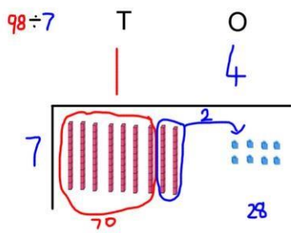
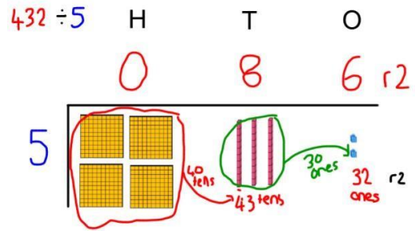
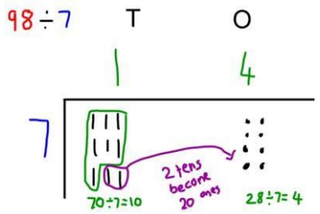
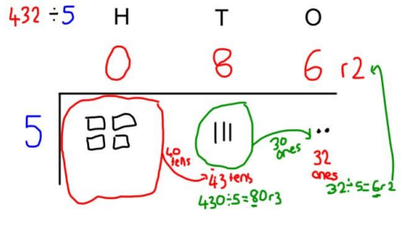


To use a formal written method of short division. Numbers up to 4 digits ÷ 1 digit number (with remainders)	Children represent division calculations using concrete materials such as base 10 and place value counters. The children partition the dividend and put inside the bus stop then divide each part by the divisor. The quotient is then recorded on the top line. The children work with numbers that involve remainders. **98 ÷ 7= 14**  **432÷5 = 86 r2**  	Children represent division calculations using informal jottings and pictorial representations. The children recognise remainders. **98 ÷ 7= 14**  **432÷5 = 86 r2**  	In Year 5 children divide numbers up to 4 digits by a 1 digit number, including 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 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 (432÷5 = 86 $\frac{2}{5}$), 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. A spoonful is **5ml**.  How many spoonfuls can you get from this bottle? Write in the missing digit. The answer **does not** have a **remainder.** 2 6 3 □ 8

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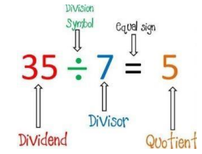
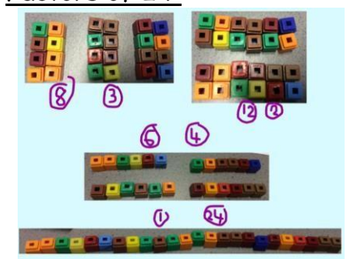
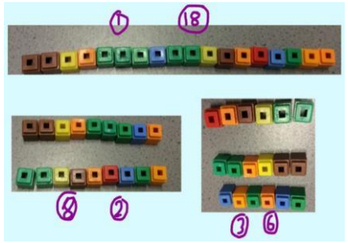
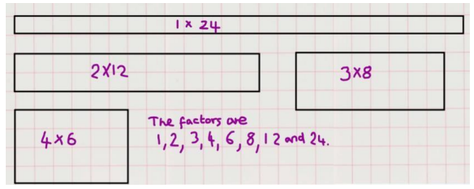
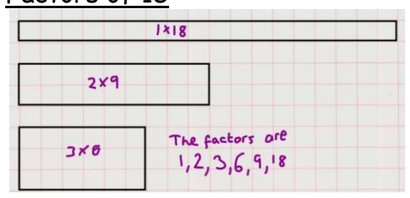
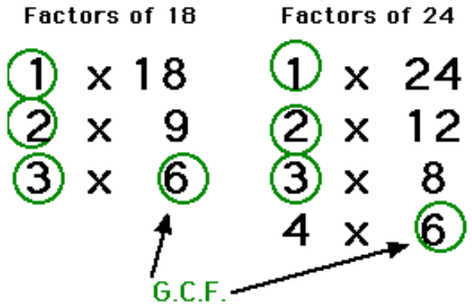
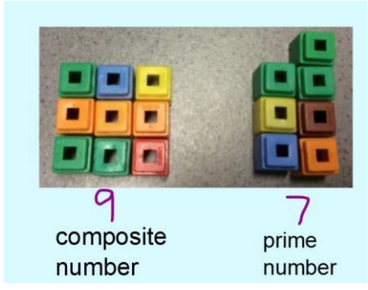
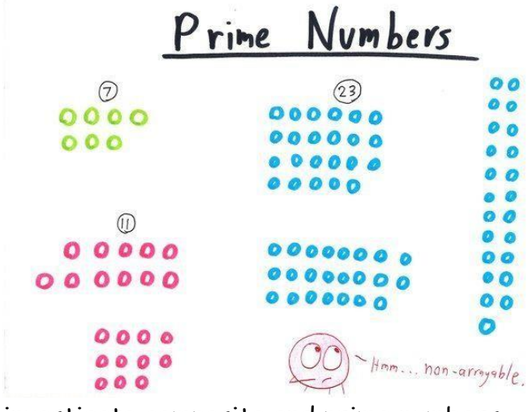
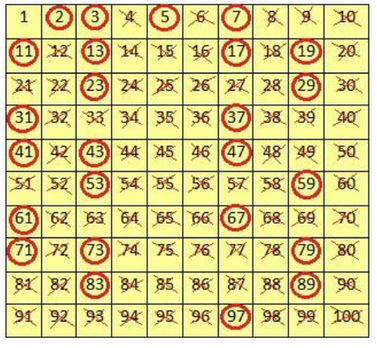


Year 6

Key Vocabulary: *factors, multiples, groups of, share, equal groups, division, divide, divided by, divided into, left over, remainder, array, prime numbers, composite numbers, grouping, groups of, sharing, doubling, halving, array, number pattern, equal, unequal, odd, even, dividend, divisor, quotient.*

Objective & Strategy	Concrete	Pictorial	Abstract
To identify common factors.	Children use physical objects to create arrays to support their understanding of factors. **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 all factors of a number by drawing arrays. They then find factors which are the same in 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.
To establish whether a number up to 100 is prime and recall prime numbers up to 19.	Children find prime numbers and composite (non-prime numbers) by using arrays. They understand that composite numbers form arrays and prime numbers cannot be arranged into arrays.  	Children use jottings and pictorial representations to  investigate composite and prime numbers.	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.They can recall all prime numbers up to 19. 

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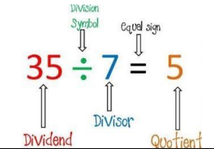
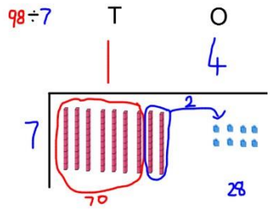
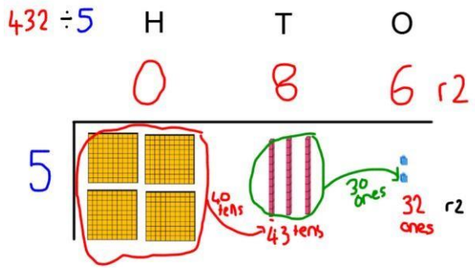
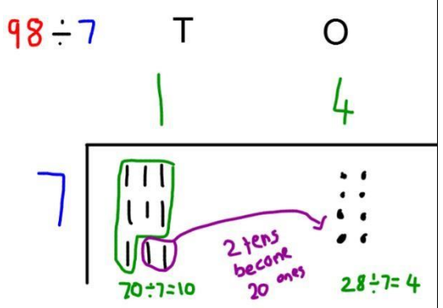
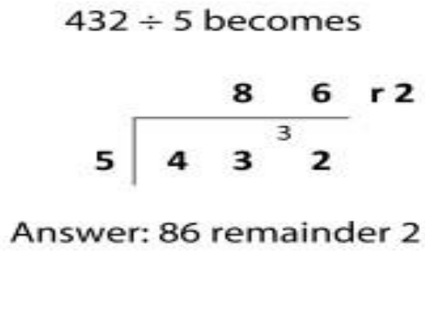
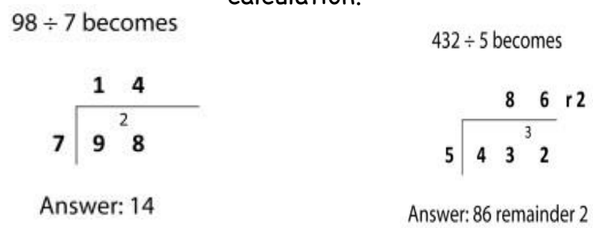
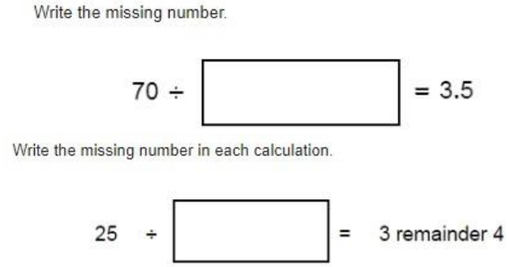


To use a formal written method of short division. Larger numbers ÷ 1 digit number (involving remainders)	Children represent division calculations using concrete materials such as base 10 and place value counters. The children partition the dividend and put inside the bus stop then divide each part by the divisor. The quotient is then recorded on the top line. The children work with numbers that involve remainders. **98 ÷ 7= 14**  **432÷5 = 86 r2**  	Children represent division calculations using informal jottings and pictorial representations. The children will recognise remainders. **98 ÷ 7= 14**  **432÷5 = 86 r2**  	In Year 6 children divide larger numbers by a 1 digit number with calculations involving remainders. The children continue to use short division method as a formal method of written calculation.  Children are expected to interpret non-integar answers by expressing results as fractions (432÷5 = 86 $\frac{2}{5}$), 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?* 

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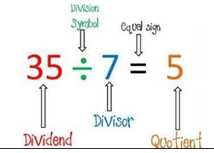
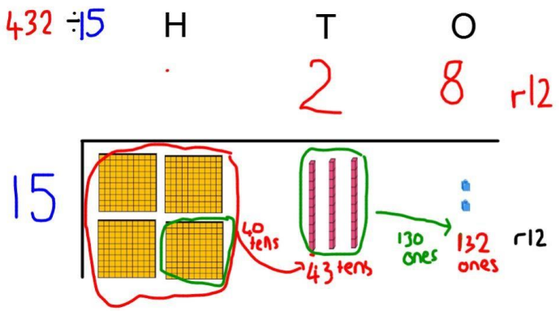
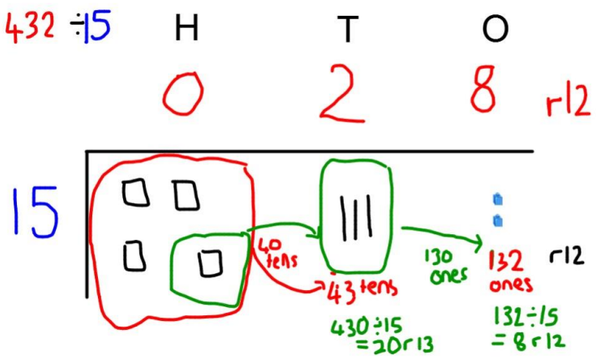
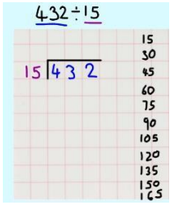


To use a formal written method of long division. Divide larger numbers ÷ 2 digit numbers (involving remainders)	Children represent division calculations using concrete materials such as base 10 and place value counters. The children partition the dividend and put inside the bus stop then divide each part by the divisor. The quotient is then recorded on the top line. 	Children represent division calculations using informal jottings and pictorial representations. 	The children use short division 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** $\frac{12}{15}$  **Step one:** Children will put the calculation into the grid and list their multiples of the divisor. **Step 2:** Use the multiples list and jottings to divide each digit the same as short division, carrying remainders to the next place. **Step 3:** The number left is your remainder; record this as a remainder fraction (or decimal to two decimal places) 432 ÷ 15 = 28 r 12/15 or 28.75 Children are expected to interpret non-integar answers by expressing results as fractions (432÷15 = 28 $\frac{12}{15}$ = 28 $\frac{4}{5}$), decimals (432÷15 = 28.8) or by rounding (432÷15 = 28.8 ≈ 29 cars) according to the context.