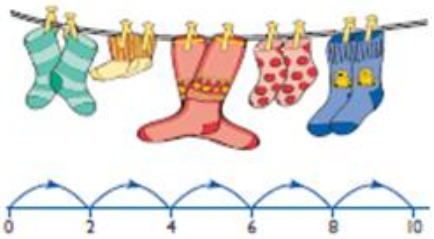
Mickleover Primary School
Calculation Policy
Division

	Learning Objectives	*Success criteria*	*Method*
EYFS	Solve problems involving halving and sharing	Using concrete apparatus, children will be able to find a given number by sharing into groups	• In practical activities and through discussion they will begin to use the vocabulary involved in division – groups, sharing. 'You have 6 buns and give your friend half. How many do you each have?'  They will record pictorially.

	Learning Objectives	Success Criteria	Method
Year 1	Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Children will be able to count on and back in 2s, 5s and 10s. Using objects and pictures, children can solve practical division problems e.g. cutting a cake in half and sharing objects.	Children should experience regular counting on and back from different numbers in 1s and in multiples of 2, 5 and 10. They should use objects to group and share amounts to develop understanding of division in a practical sense.  They should begin to recognise the number of groups counted, to support understanding of relationship between multiplication and division.  $2+2+2+2+2=10$ $2\times5=10$ 2 multiplied by 5 5 pairs 5 hops of 2
	Recognise, find and name a half as one of two equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	Children will understand how to find a half of a number, shape and quantity by equal sharing. Children will understand how to find a quarter of a number, shape and quantity by equal sharing. The children will be introduced to the ÷ sign.	Through practical activities children will find half and then a quarter by sharing.  http://app.mymaths.co.uk/82-resource/introducing-fractions Children will use jottings to record both sharing equally and grouping. Then begin to use the ÷ sign to record their division problems. $10 \div 2 = 5$

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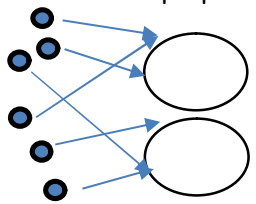
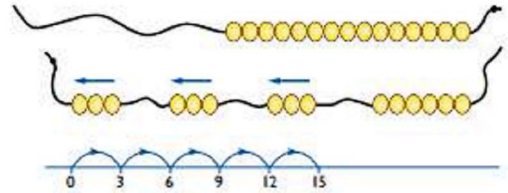
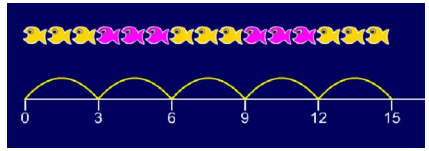
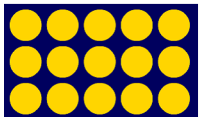
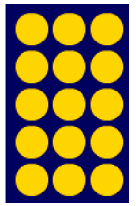
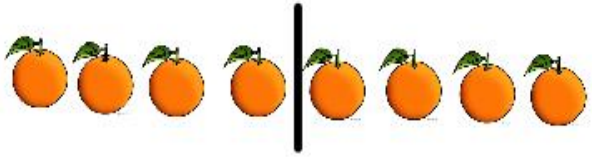
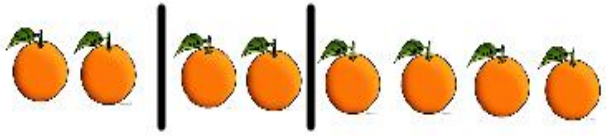
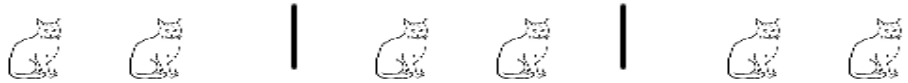
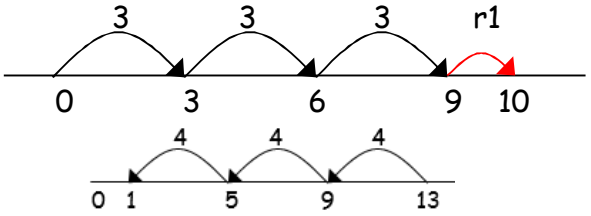
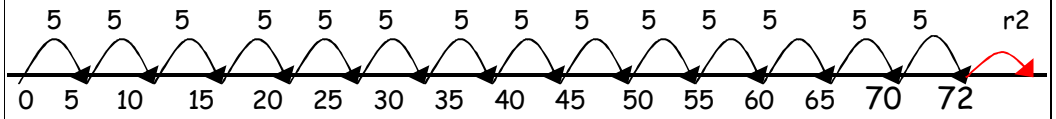
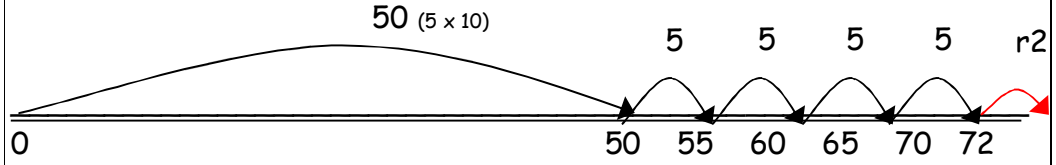
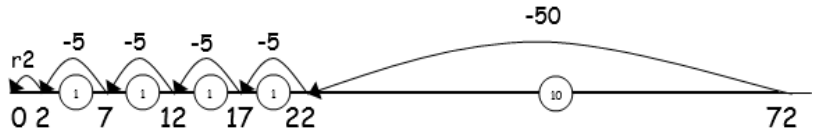
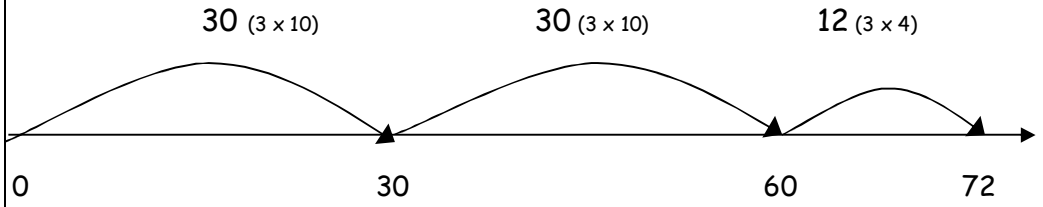
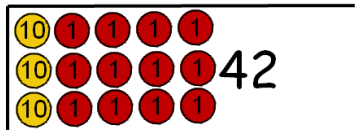
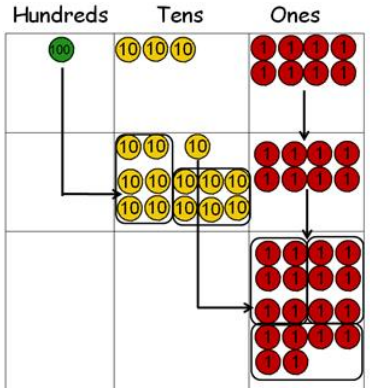
Year 1	Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	Children will be able to share out a set of objects equally using one to one correspondence. Children will be able to use counting skills to begin to develop understanding of grouping.	<u>Sharing</u> – Children will have practical opportunities to share out by giving one to each plate. E.g. 6 sweets are shared between 2 people. How many do they have each?  16 children went to the park at the weekend. Half that number went swimming. How many children went swimming? <u>Grouping</u> - There are 6 sweets. How many people can have 2 sweets each?  You have 15 cubes. How many towers of 3 cubes can you make?'  How many pairs of gloves if you have 12 gloves?

	Learning Objectives	Success Criteria	Method
Year 2			Children should count regularly, on and back, in steps of 2, 5 and 10.
	Recognise odd and even.	Given a number, children will be able to say whether it is odd or even.	E.G. Sort these numbers into odd and even 15, 27,34, 75, 82
	Recall division facts for the 2, 5 and 10 multiplication tables.	Know and understand sharing and grouping. (See year 1)	<u>Grouping using a numberline</u> Group from zero in jumps of the divisor to find our 'how many groups of 3 are there in 15?ô
	Calculate mathematical statements for division within the multiplication tables and write them using division (÷) and equals (=) signs.	The children will use the ÷ sign.	15 ÷ 3 = 5  
	Solve problems involving division, using materials, arrays, repeated subtraction, mental methods, and division facts, including problems in contexts.	Children will be able to solve simple division sentences.	Children will be introduced to arrays as a pictorial representation to show division. 15 ÷ 3 = 5. There are 5 groups of 3. 15 ÷ 5 = 3. There are 3 groups of 5.   E.g. 15 pencils shared between 3 pots, how many in each pot? Children should continue to use grouping and sharing for division using practical apparatus, arrays and pictorial representations.

	Learning Objectives	Success criteria	Method
Year 2	Show that while multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.	Children understand division will start with the largest number and while multiplication of two numbers can be done in any order, the division of numbers can only be done in one order.	Continue work on arrays. Support children to understand how multiplication and division are inverse. Look at an array – what do you see? Multiplication is commutative. 4 x 5 = 5 x 4 ✓ Division is not commutative. 20 ÷ 4 = 4 ÷ 20 ✗ They will explore visually and understand how some fractions are equivalent. http://app.mymaths.co.uk/82-resource/introducing-fractions
	Children should find a half, a quarter and a third, of shapes, objects numbers and quantities. Finding a fraction of a number of objects to be related to sharing.	Children will find half by dividing by 2, a third by dividing by 3 practically where possible.	e.g. two quarters is the same as one half.  Half 1/2 Half 1/2  Quarter $\frac{1}{4}$ Quarter $\frac{1}{4}$ 2 Quarter 2/4 = $\frac{1}{2}$  Third 1/3 Third 1/3 Third 1/3

	Learning Objectives	Success criteria	Method
Year 3	Count forward and backward in twos, threes, fives and tens. Know division facts for the 3 and 5 times tables. Know halves to 20.	Understand place value in two-digit numbers and how zero is a place holder. Understand that division is **not** commutative e.g. 12 ÷ 3 = 3 ÷ 12 Understand that division is the inverse of multiplication. e.g. 4 × 3 = 12, 3 × 4 = 12, 12 ÷ 3 = 4, 12 ÷ 4 = 3.	1) Solve division through repeated addition or subtraction that involves remainders, e.g. **10 ÷ 3 = 3 r1**  **72 ÷ 5 = 14 r2**  Moving onto (when the dividend is more than ten times the divisor):  

	Learning Objectives	Success criteria	Method
Year 4	Count, read and write numbers to 1000. Count from 0 in multiples of 4, 6, 8, 50 and 100. Know multiplication facts for the 4, 6 and 8 times tables. Know halves to 50. Can multiply mentally three numbers.	Understand place value in three-digit numbers. Understand how to divide larger numbers by using related facts, e.g. 600 ÷ 3 = 200 by using 6 ÷ 3 = 2 Understand how to divide by 10 and 100 (shifting digits to the right). Understand how the inverse can be used to check answers.	Then onto the vertical method: Supported by the number line method initially 72 ÷ 3  72 ÷ 3 http://app.mymaths.co.uk/136-resource/division-chunking 3) 72 - 30 3x10 42 - 30 3x10 12 - 12 3x4 0 24 ← 2) Use arrays to help visualise division and to introduce the bus stop. 1 4 3 42  Exchanging a 10 for ten 1

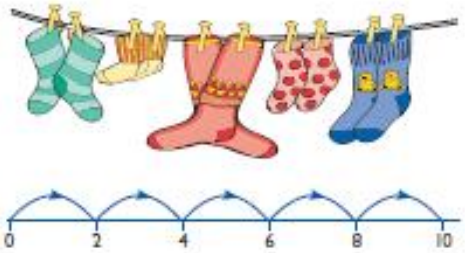
	Learning Objectives	*Success criteria*	*Method*
Year 5	Count, read and write numbers to 1000. Count from 0 in multiples of 4, 6, 8, 50 and 100. Know multiplication/division facts for the 4, 6 and 8 times tables. Know halves to 50.	Understand place value in three-digit numbers. Understand how to divide larger numbers by using related facts, e.g. 600 ÷ 3 = 200 by using 6 ÷ 3 = 2 Understand how to divide by 10 and 100 (shifting digits to the right). http://app.mymaths.co.uk/1423-resource/dividing-by-10-and-100 Understand how the inverse can be used to check answers.	http://app.mymaths.co.uk/136-resource/division-chunking Using rods/counters on laminated grids to support long division. In books: 972 ÷ 36 36)972 720 (20) x 36 252 180 (5) x 36 72 (2) x 36 72 0 27 answer  Or using dienes blocks 2 3 6 | 1⁰ 1³ 8 1 2 0 1 8 1 8 0 Remainder Interpret remainders for the context. http://app.mymaths.co.uk/1767-resource/interpreting-remainders

Supported by the use of a "shopping list"
360 (36 x 10)
720 (36 x 20)
1080 (36 x 30)

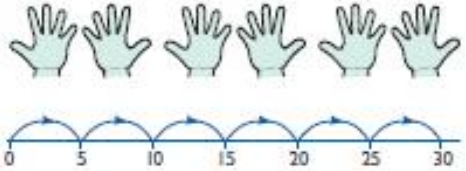
	Learning Objectives	Success Criteria	Method
Year 6	Count, read and write numbers beyond 1000. Count in multiples of 7, 9, 25 and 1000. Recall multiplication facts for times tables up to 12 × 12. Be able to divide mentally increasingly large numbers. Find common factors and multiples.	Understand place value in four-digit numbers and beyond. Understand how rounding can be used to estimate and check answers. Understand how to divide whole numbers and decimals by 10, 100 and 1000 (shifting digits to the right). http://app.mymaths.co.uk/1423-resource/dividing-by-10-and-100 <u>Upper KS2</u> Understand the use of brackets. e.g. (10 + 2) ÷ 3 = 1 + (2 + 5) Begin to understand the order of operations – BODMAS. B = Brackets O = Orders (powers and square roots) DM = Division and Multiplication AS = Addition and Subtraction	http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/school_booster/busstopdivision.html Divide numbers up to four-digit by two-digit number using the short ('bus stop') method 8 | ~~6~~ $^{6}0$ $^{4}9$ $^{1}6$ — 0 7 6 2 3018 ÷ 8 8 | ~~3~~ $^{3}0$ $^{6}1$ $^{5}8$. $^{2}0$ $^{4}0$ — 0 3 7 7 . 2 5 **or** 377 r 2 **or** 377 $^{2}/_{8}$ Interpret remainders as whole number remainders, fractions, or by rounding, depending on the context <u>Extended to decimals:</u> 5 | ~~1~~ $^{1}2$ $^{2}3$ $^{3}8$. $^{3}9$ $^{4}5$ — 0 2 4 7 . 7 9

			For division by 2 digit numbers introduce long division as per mymaths http://app.mymaths.co.uk/1714-resource/introducing-long-division tab 6 6174 ÷18 $$\begin{array}{r} 343 \\ 18\overline{)6174} \\ 54 \\ \hline 77 \\ 72 \\ \hline 54 \\ 54 \\ \hline 0 \end{array}$$ Extending to decimals tab 8 http://app.mymaths.co.uk/1714-resource/introducing-long-division $$\begin{array}{r} 288{\cdot}2 \\ 15\overline{)4323{\cdot}0} \\ 30 \\ \hline 132 \\ 120 \\ \hline 123 \\ 120 \\ \hline 30 \end{array}$$

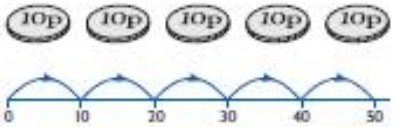
Models and images for understanding multiplication and division



$2 + 2 + 2 + 2 + 2 = 10$
$2 \times 5 = 10$
2 multiplied by 5
5 pairs
5 hops of 2



$5 + 5 + 5 + 5 + 5 + 5 = 30$
$5 \times 6 = 30$
5 multiplied by 6
6 groups of 5
6 hops of 5

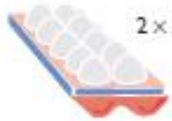


$10p + 10p + 10p + 10p + 10p = 50p$
$10p \times 5 = 50p$
5 hops of 10

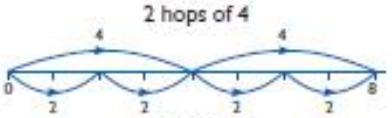
$4 \times 2 = 8$
$2 \times 4 = 8$

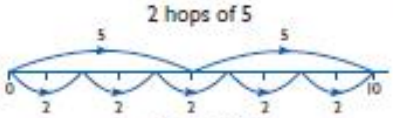
$5 \times 2 = 10$
$2 \times 5 = 10$

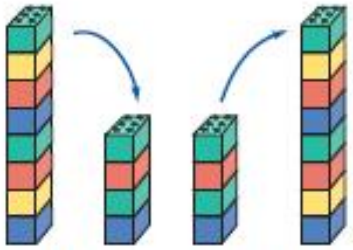
$2 \times 4 = 8$
$4 \times 2 = 8$



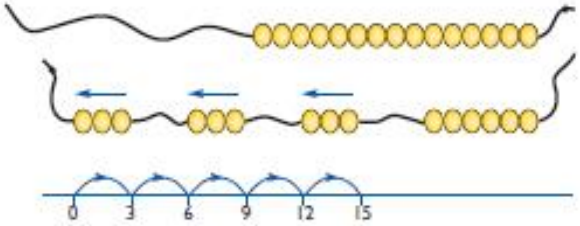
$2 \times 5 = 10$
$5 \times 2 = 10$







half of 8 is 4
$8 \div 2 = 4$
double 4 is 8
$4 \times 2 = 8$



5 hops in 15. How big is each hop?
$15 \div 5 = 3$
15 shared between 5