# Progression in Calculation – Division

Foundation Stage				
<b>Objective &amp; Strategy</b>	Concrete	Pictoral	Abstract	
Solve problems including halving	Halving by sharing into 2 equal groups	Draw whole and two equal parts to show halving	Use part-part–whole method to show two equal parts	
Solve practical problems that involve sharing into equal groups		Draw the apparatus to show the story $ \begin{array}{c c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	Show alongside a number track	
Year 1				
Division as grouping and sharing	Divide quantities by sharing equally and also dividing into equal groups.	10 ÷ 2 = 5 Sharing between 2	Introduce the symbol ÷ as divided into groups of. 15, divided into groups of 5 = 3 groups 15 ÷ 5 = 3 Focus on concrete examples and pictorial	
	12 divided into groups of 4 = 3 groups 12 divided into 3 groups = groups of 4		representations	

Dividing using arrays	Arrange the apparatus as arrays We can demonstrate the link beween $12 \div 4 = 3$ and $12 \div 3 = 4$	$12 \div 3 = 4$	
Year 2			
Division with arrays	$15 \div 3 = 5$ $15 \div 5 = 3$ This array shows that $15 \text{ can be divided}$ into groups of 3 = 5 groups Also that 15 can be shared equally by 3 = groups of 5	Draw an array and use rings to split the array into groups to make multiplication and division sentences. $12 \div 3 = 4$	Find the inverse of multiplication and division sentences by creating four linking number sentences. $5 \times 3 = 15$ $3 \times 15 = 15$ $15 \div 3 = 5$ $15 \div 5 = 3$
Division with a remainder	Divide 14 into groups of 3 (organised as rows) and see how much is left over	Draw arrays and clearly show a remainder.X X X X X14 divided into groups of 3, creates 4 equal groups and leaves 2.X X X X2.4 remainder 2	Repeated addition on a number line, showing the remainder clearly x 3 + 6 + 9 + 12 + 15 $17 \div 3 = 5 r 2$

Year 3 and 4					
Division using a	36 ÷ 4 =	36 ÷ 4 =	36 ÷ 4 =		
number line with					
quotients less than	1 2 3 4 5 6 7 8 9		<u>4 8 12 16 20 24 28 32 36</u>		
12.	4 8 12 16 20 24 28 32 36	<u>xxxx xxxx xxxx xxxx xxxx xxxx xxxx xx</u>	1 2 3 4 5 6 7 8 9 Children are to use the numbers to represent		
	Model next to a written example of the number line.	Children to use pictures to represent the different groups they are counting when dividing 36 into groups of 4.	the groups they are counting when dividing 36 into groups of 4.		
Children are to use the r <b>provide</b> a quotient abov	l number line method to divide 2-digit number by a re 12 as this will be an inefficient method.	single digit. The numbers the children are handling	g whilst using the above method should <b>not</b>		
Division using a	42 ÷ 3 =	42 ÷ 3 =	42 ÷ 3 =		
number line with quotients more than 12.	Children are to use the manipulatives to use number lines and begin to make links to multiplication facts.	Children are to use the marks on number lines and begin to make links to multiplication facts.	Children are to use numbers with repeated addition to use multiplication (through repeated addition) to calculate the number		
		3 6 9 12 15 18 21 24 27 30 33 36 39 42	groups of 3. 1 2 3 4 5 6 7 8 9 10 11 12 13 14		
	Children to continue to make groups of three and are encouraged to count in lots of 3 to reach 42.		3 6 9 12 15 18 21 24 27 30 33 36 39 42		
	3 6 9 12 15 18 21 24 27 30 33 36 39 42				







	Children group the 25 in to 8 groups of 3 and show they have 1 remainder. Write out as you model using the manipulatives $\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Year 5 and 6							
	Number Facts		Writte	n Algori	ithm		
Introduction long division	5888 ÷ 32 1 x 32 = 32 (Number stays the same) 2 x 32 = 64 (Double 1 x 32) 3 x 32 = 96 (Add 32 to 2 x 32) 4 x 32 = 128 (Double 2 x 32) 5 x 32 = 160 (Half 10 x 32) 6 x 32 = 192 (Double 3 x 32) 7 x 32 = 224 (6 x 32 + 32) 8 x 32 = 256 (Double 4 x 32) 9 x 32 = 288 (8 x 32 + 32 or 10 x 32 - 32 (whichever is each of the second	asiest)	3 2 3 2 3 2 3 2	0 1 5 8 3 2 0 1 5 8 3 2 2 6 2 5 0 1 5 8 3 2 2 6 3 2 2 6 3 2 2 6	8 9 0 0 8 9 0 0 8 8 6 0 8 4 8 9 0 0 8 8	(32 x 100) (32 x 100) (32 x 80) (32 x 100)	Establish with the children that 5800 will be put in to groups of 32. 100 groups of 32 make 3200. Children then find the difference to continue grouping. Establish with the children that 2688 will be put in to groups of 32. 80 groups of 32 make 2560. Children then find the difference to continue grouping.

		2 5 6 0 (32 x 80)
		1 2 8
		1 2 8 (32 x 4)
Embedding long	5888 ÷ 32	
division with no		Children to establish that the quotient
remainders.	1 x 32 = 32 (Number stays the same)	3 2 5 8 8 9 cannot be greater 1000 because 32 x
	2 x 32 = 64 (Double 1 x 32)	3 2 1000 = 32000. Children will then know
	$3 \times 32 = 96$ (Add 32 to 2 x 32)	that 5800 divided by 32 is going to give a
	$4 \times 32 = 128$ (Double 2 x 32)	auotient of over 100 because 32 x 100 =
	$5 \times 32 = 160 (Holf 10 \times 22)$	3200
	$5 \times 32 = 100$ (hall 10 × 32) 6 × 22 = 102 (Double 2 × 22)	5200.
	$0 \times 32 = 192 (Double 5 \times 52)$	1 8 Children will then know 2680 divided hy
	$7 \times 32 = 224 (6 \times 32 + 32)$	3 2 5 8 8 9 32 is going to give a quotient of 80 and a
	$8 \times 32 = 256$ (Double 4 × 32)	$3^{2}$ remainder Children find the difference
	$9 \times 32 = 288 (8 \times 32 + 32 \text{ or } 10 \times 32 - 32 \text{ (whichever is easiest)})$	$\frac{2}{2}$ $\frac{6}{6}$ $\frac{8}{6}$ between 2680 and 2560 to give 128
	$10 \times 32 = 320$ (Place value $10 \times 32$ )	2 5 6
	11 x 32 = 352 (10 x 32 add 32)	
	12 x 32 = 384 (10 x 32 + 2 x 32)	1 8 4 Children then know that 128 divided by
		3 2 5 8 8 9 32 is 4
		3 2
		2 6 8
		2 5 6
		1 2 8
		1 2 8
		0
Long division with a	5889 ÷ 32	
remainder.		1 Children to establish that the quotient
	1 x 32 = 32 (Number stays the same)	3 2 5 8 8 9 cannot be greater 1000 because 32 x 1000 =
	2 x 32 = 64 (Double 1 x 32)	3 2 32000. Children will then know that 5800
	3 x 32 = 96 (Add 32 to 2 x 32)	divided by 32 is going to give a quotient of
	4 x 32 = 128 (Double 2 x 32)	over 100 because 32 x 100 = 3200.
	5 x 32 = 160 (Half 10 x 32)	

6 x 32 = 192 (Double 3 x 32)	1 8 Children will then know 2680 divided by 32 is
7 x 32 = 224 (6 x 32 + 32)	3 2 5 8 8 9 going to give a quotient of 80 and a
8 x 32 = 256 (Double 4 x 32)	3 2 remainder. Children find the difference
9 x 32 = 288 (8 x 32 + 32 or 10 x 32 – 32 (whichever is easiest)	2 6 8 between 2680 and 2560 to give 128.
10 x 32 = 320 (Place value 10 x 32)	2 5 6
11 x 32 = 352 (10 x 32 add 32)	
12 x 32 = 384 (10 x 32 + 2 x 32)	1 8 4 Children then know that 128 divided by 32 is
	3 2 5 8 8 9 4. When you have found the difference and
	3 2 the number is less than the divisor, you have
	2 6 8 found the remainder.
	2 5 6
	1 2 9
	1 2 8