Mental Maths Calculation Policy: Division

The rationale for the Mental Maths Calculation Policy is to help provide teachers and children with a variety of strategies to tackle arithmetic questions without being overly reliant on formal written methods. The aim of this document is to help children becoming fluent, flexible and accurate in their mental calculation and help them to draw on their knowledge of known facts. Below is a grid for all four categories of calculation, the potential strategies that can be applied and in which year groups you could use these strategies. This policy should be used in conjunction with the written methods calculation policy. This policy was inspired by the book Number Talks: Whole Number Computation by Shelly Parrish.

Category	Strategy	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Division	Repeated subtraction or sharing/ dealing out	✓	✓	✓			
	Proportional reasoning		✓	✓	✓	✓	✓
	Multiplying up				✓	✓	✓
	Partial Quotients				✓	✓	✓

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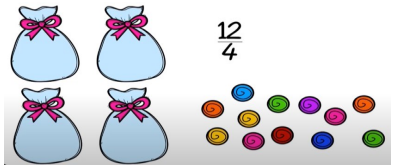
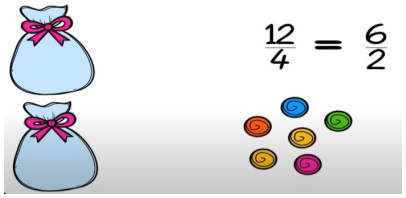
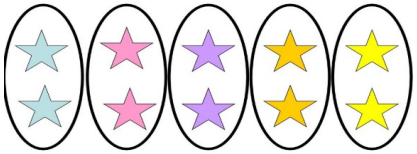
Strategy and method	Recorded Strategy	Representation (and practical strategy) Concrete	Pictorial	Abstract
Repeated Subtraction or Sharing/ Dealing Out. Repeated subtraction maybe used when first starting to divide. It is one of the least efficient methods especially as sizes of numbers increase.	30 ÷ 5 30 - 5 = 25 25 - 5 = 20 20 - 5 = 15 15- 5= 10 10- 5 = 5 5- 5 = 0 There were six groups of 5.	Martha has 8 cookies she shares between 2 children. 8 ÷ 2 = 4  The child picks two faces to represent two children and shares out the 8 counters/multilink cubes to represent cookies.	Martha has 30 cookies that she shares between 5 friends. How many cookies will each friend receive? 222 222 222 222 222 Numbers could be replaced by dots. 2 + 2 + 2 = 6 Teacher can scaffold a child's understanding of dealing out/ repeated subtraction using	Looking at the pictorial problem First dealing out of 2 cookies per person: 5 x 2 = 10 Second dealing out: 5 x 2 = 10 Third Dealing out: 5 x 2 = 10 So 5 x 6 = 30 and 30 ÷ 5 = 6
Proportional Reasoning This is where you can divide the dividend and divisor by the same amount to create a simpler problem. If the dividend and divisor share common factors, then the problem can be simplified.	12 ÷ 4 Children can apply their knowledge of common factors that both the dividend (12) and the divisor (4). Both numbers have a common factor of 2. So this can be simplified 12 ÷ 4 ÷2 ÷2 6 ÷ 2 = 3	Multilink cubes can be used to support here in a similar way to the sharing/dealing out method.  This becomes: 	 20 ÷ 4  Becomes 10 ÷ 2 = 5 This can be solved through sharing or grouping	384 ÷ 16 384 ÷ 16 ÷2 ÷2 192 ÷ 8 ÷2 ÷2 96 ÷ 4 ÷2 ÷2 48 ÷ 2 = 24 So 24 is the answer to all the above equations including 384 ÷ 16= 24

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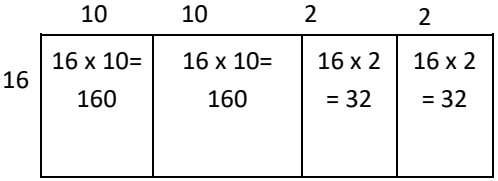
Multiplying Up Similar to the Adding Up strategy in Subtraction. Children can access division by building on their strengths with multiplication.	384 ÷ 16 10 x 16 = 160 10 x 16 = 160 (320) 2 x 16 = 32 (352) 2 x 16 = 32 (384)	Would not recommend children using this strategy if still reliant on concrete apparatus or arrays.	This method can be used in conjunction with the Bar model.  160 + 160 = 320 320 + 32 = 352 352 + 32 = 384	
Partial Quotients This strategy maintains place value and mathematically correct information. Children can work their way to the quotient by using friendly multipliers such as tens, fives and twos.	384 ÷ 16 384 - 160 = 224 (10) 224- 160 = 64 (10) 64- 32 = 32 (2) 32 - 32 = 0 (2) 10 + 10 + 2 + 2 = 24	Would not recommend children using this strategy if still reliant on concrete apparatus or arrays.	Would not recommend children using this strategy if still reliant on concrete apparatus or arrays.	This method can become more efficient when the child uses larger multipliers. 384 ÷ 16 384 - 320 = 64 (20) 64 - 64 = 0 (4) 20 + 4 = 24