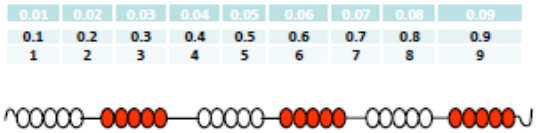
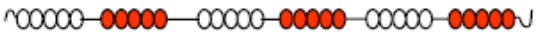
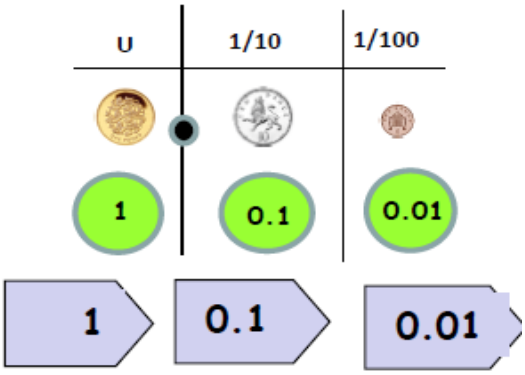
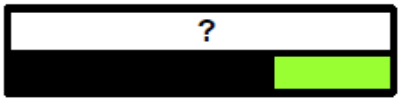
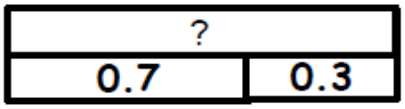
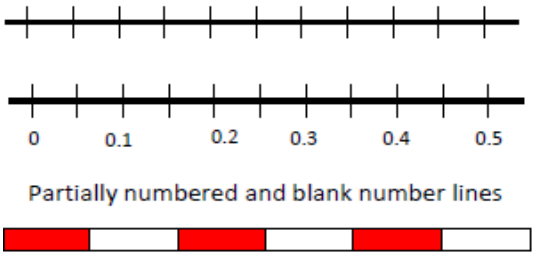
Barnfields Primary School
'Believe & Achieve'

Barnfields Primary School
Calculation Policy

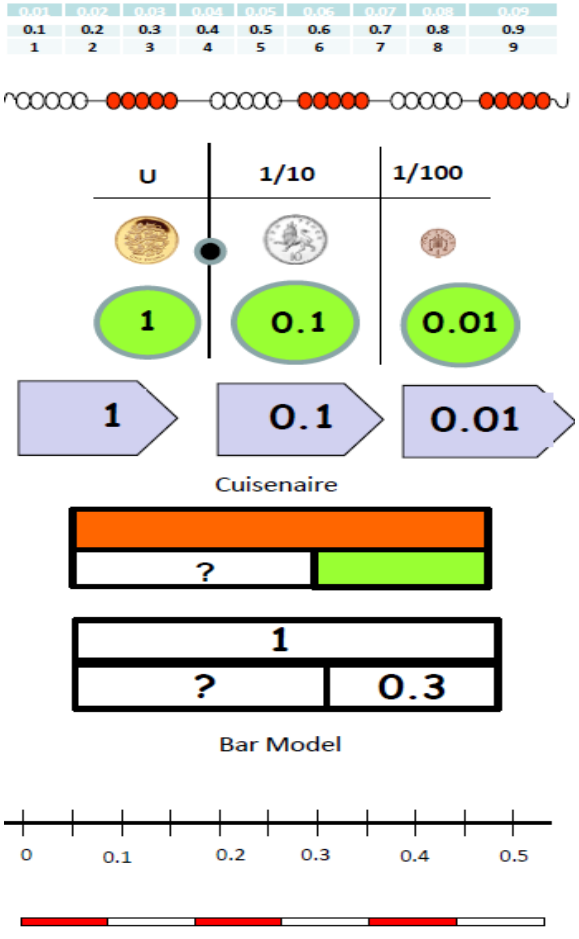
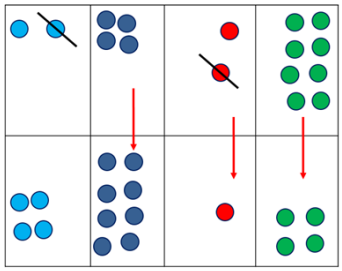
Year 5

Addition Calculation: Year 5	
Mental Calculation	• **Add numbers mentally with increasingly large numbers** • **Mentally add tenths, and one-digit numbers and tenths.** • **Add decimals, including a mix of whole numbers and decimals, decimals with different number of places and complements of 1 (e.g.0.83 + 0.17= 1)** *Refer back to pictorial and physical representations when needed.*
Written Calculation	• **Add whole numbers with more than 4 digits, including using formal written methods (columnar addition).** • Include decimal addition for money.

Possible Concrete and Visual Representations	Teacher Modelling/Children's Recordings
   Cuisenaire  Bar Model   Partially numbered and blank number lines 	***Manipulatives could be used alongside algorithms*** 2141 + 1128 = 3269 21.41 + 1.12 + 0.35 = 22.88 Column addition (no exchanging) 5189 + 3128 = 8317 (11) 51.89 + 3.128 = 55.018 (1 1) Column addition (with exchanging) *Addition with decimals up to three decimal places including in different contexts e.g. money and measures*

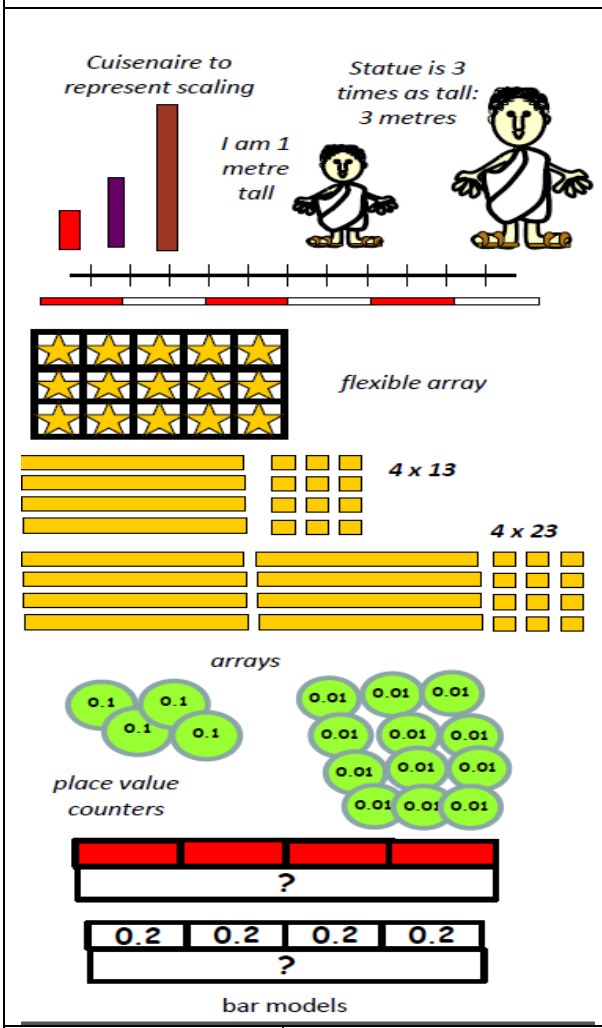
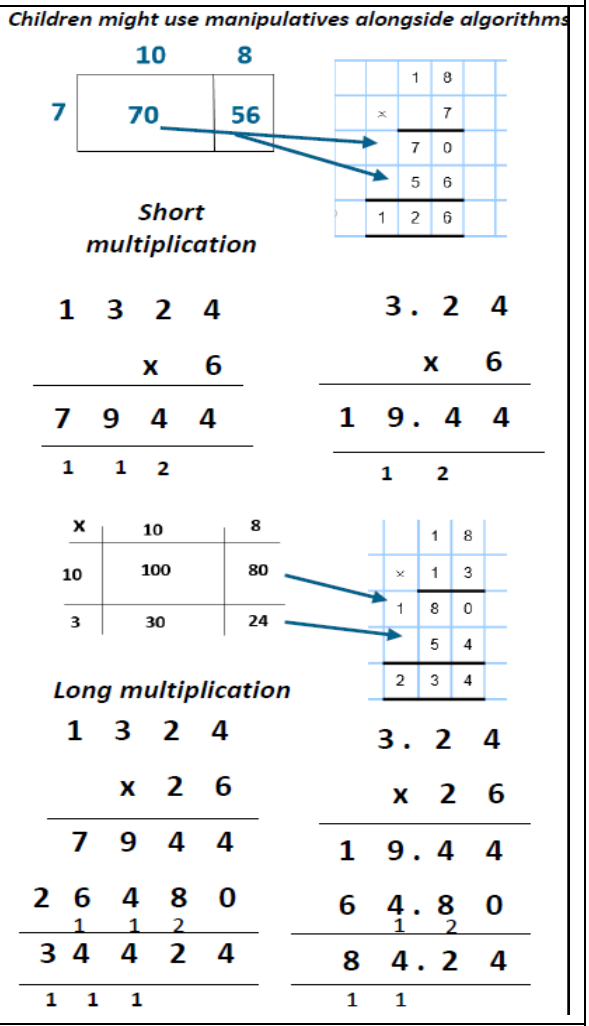
Fluency	• Count forwards in powers of ten up to 100000 • Count forwards in positive and negative whole numbers through zero • Practise mental calculations with increasingly large numbers • Practise fluency of written methods

Subtraction Calculation: Year 5	
Mental Calculation	• **Subtract numbers mentally with increasingly large number e.g. 12 462 – 2300 = 10 162** • **Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.** • ***Pupils practise subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, 1 – 0.17 = 0.83).*** • ***Pupils mentally subtract tenths, and one-digit whole numbers and tenths.***
Written Calculation	**Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction).** • *(Pupils) practise subtracting decimals.* • *Begin with three-digit numbers using formal, columnar method; then move into four-digit numbers.*

Possible Concrete and Visual Representations	**Teacher Modelling/Children's Recordings**
	 6232 - 4814 = 1418 *Children might use manipulatives alongside algorithms* Column subtraction (no exchanging) 13548 - 12128 = 1420 Column subtraction (with exchanging) 13423 - 12678 = 745 ***Ensure children can solve calculations where zero is a place holder*** 1.48 - 1.21 = 0.27 Column subtraction (no exchanging) Column subtraction (with exchanging) 7.23 - 3.67 = 3.56 *Subtraction with decimals up to three decimal places including in different contexts e.g. money and measures*

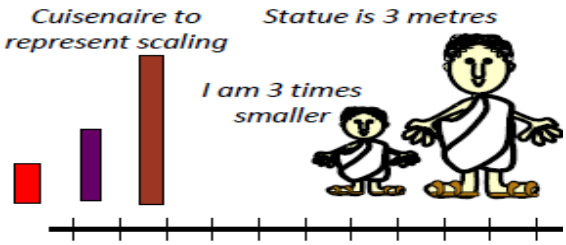
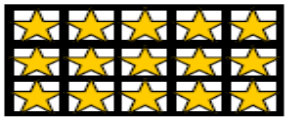
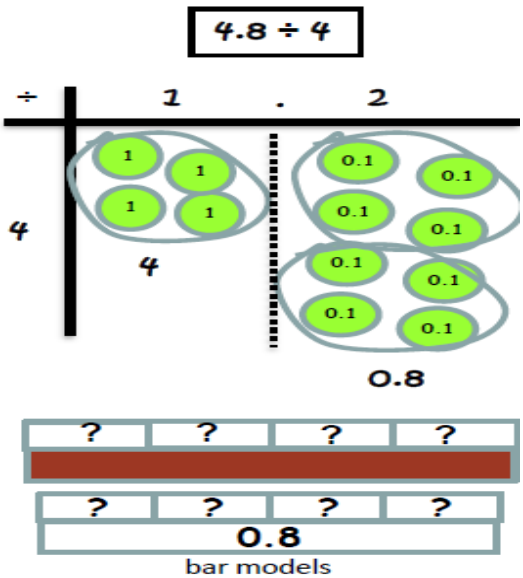
Fluency	♦ Count backwards in powers of ten up to one million ♦ Count backwards in positive and negative whole numbers through zero ♦ Practise mental calculations with increasingly large number

Multiplication Calculation: Year 5	
Mental Calculation	• **Multiply and divide numbers mentally drawing upon known facts** • **Multiply and divide whole numbers and those involving decimals by 10, 100 & 1000** • **Recognise and use square & cube numbers (& notation)**
Written Calculation	♦ **multiply numbers up to 4 digits by a one - or two -digit number using a formal written method, including** ♦ **long multiplication for two -digit numbers** *Compact methods for multiplication are efficient but often do not make the value of each digit explicit. When introducing multiplication of decimals, it is sensible to take children back to an expanded form such as the grid method where the value of each digit is clear, to ensure that children understand the process.* *Revert to expanded methods if children find formal calculation method difficult (see Y3/Y4)*

Possible Concrete and Visual Representations	**Teacher Modelling/Children's Recordings**
	

Fluency	♦ Count forwards in steps of powers of 10 from any given number up to 1 000 000 ♦ Practise and extend use of formal written method of short multiplication ♦ Apply all multiplication tables frequently. Commit them to memory and use them confidently to make larger calculations ♦ Multiply numbers mentally drawing upon known facts

Division Calculation: Year 5	
Mental Calculation	**Pupils should be taught to:** • **multiply and divide whole numbers and those involving decimals by 10, 100 and 1000** • **multiply and divide numbers mentally drawing upon known facts** • **identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.** ***Pupils apply all the multiplication tables and related division facts frequently and use them confidently .***
Written Calculation	♦ **Pupils practise and extend their use of the formal written methods of short multiplication and short division.** ♦ **Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.**

Possible Concrete and Visual Representations	**Teacher Modelling/Children's Recordings**
  *flexible arrays*  bar models	To find 196 ÷ 6, start by multiplying 6 by 10, 20, 30, … to find that 6 × 30 = 180 and 6 × 40 = 240. The multiples of 180 and 240 trap the number 196. This tells us that the answer to 196 ÷ 6 is between 30 and 40. Start the division by first subtracting 180, leaving 16, and then subtracting the largest possible multiple of 6, which is 12, leaving 4. $6\overline{)196}$ $-\ 180 \quad 6 \times 30$ 16 $-\ 12 \quad 6 \times 2$ $4 \qquad 32$ Answer: $32\ \mathrm{R}\ 4$ The quotient 32 (with a remainder of 4) lies between 30 and 40, as predicted.

Fluency	♦ Count backwards in steps of powers of 10 for any given number up to 1 000 000 ♦ Count backwards with positive/negative whole numbers through zero ♦ Practise mental calculation with increasingly large numbers ♦ Apply all multiplication tables and related division facts frequently, commit them to memory and use them to confidently to make larger calculations