KIWI PRIMARY SCHOOL CALCULATION POLICY

Calculation Policy 2023-24

The following Calculation Policy has been largely adapted from the White Rose Maths Calculation Policy, with additional material from NCTEM and Third Space Learning, and meets requirements of the National Curriculum 2014 for the teaching and learning of mathematics, in accordance with an increased emphasis on fluency and mastery of concepts.

It is designed to provide pupils with a clear and smooth progression of learning through KSI and KS2 and ensure that the teaching of calculation methods remains consistent across the 4 operations of addition, subtraction, multiplication and division. The consistent use of the CPA (concrete, pictorial, abstract) approach helps children develop mastery across all the operations in an efficient and reliable way. This policy shows how these methods develop children's confidence in their understanding of both written and mental methods.

The school calculation policy builds progressively from the content and methods established in EYFS, with a recognition that concrete and pictorial representations of problems continue to play a valuable role throughout all key stages.

Age-stage expectations - The calculation policy is organised according to age-stage expectations as set out in the National Curriculum (2014); however, we recognise that pupils need to be taught at an appropriate level 'based on the security of pupil's understanding and their readiness to progress to the next stage' (National Curriculum). This 'readiness to progress' is a clear focus at this challenging time and there will be a clear emphasis on recapping and reviewing methods from previous years where needed.

Context for calculation - It is crucial that children are given real-life contexts and problems in which to use and apply their calculation methods. Children subsequently develop a more secure understanding of the purpose of calculations and learn to choose their operations with accuracy. This is a priority in an increasingly-challenging curriculum, with its focus on mastery.

Choosing a calculation Method - Children must be taught and encouraged to use a simple process in deciding what approach to take to a calculation, ensuring that they select the most appropriate method for the problem, whether mental or written. Children need to be comfortable with a wide variety of strategies and representations in order to demonstrate this.

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Key Vocabulary Progression Chart

EYFS	
Number & Place Value	Number , zero, one, two, three to twenty, none, count (on/up/to/from/down), before, after, more, less, least, greater, ones, tens, numeral
Addition & Subtraction	Number bonds, number line, add, more, plus, make, sum, total, altogether, inverse, double, half, subtract, take away, minus
Year 1	
Number & Place Value	Zero, one, two, three to twenty, and beyond, many, few, fewer, fewest, smallest, lesser , equal to, the same as , odd, even, pair, ten more/less, digit, figure(s), compare (In) order/a different order, size, value, between, halfway between, above, below
Addition & Subtraction	Near doubleHalve Equals, is the same as (including equals sign) Difference between How many more to make...? How many more is...than...? How much more is...? How many fewer is...than.? How much less is...?
Multiplication & Division	Odd, even Count in twos, threes, fives Count in tens (forwards from/backwards from) How many times? Lots of, groups of Once, twice, three times, five times Multiple of, times, multiply, Repeated addition Double, halve Share, share equally Group in pairs, threes, etc. Equal groups of Divide, left, left over
Year 2	
Number & Place Value	Numbers to one hundred Hundreds Partition, recombine Hundred more/less
Four Operations	Array, row, column Multiply by Divided by Inverse
Year 3	
Number & Place Value	Numbers to one thousand
Addition & Subtraction	Column addition and subtraction

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Multiplication & Division	Product Multiples of four, eight, fifty and one hundred
Year 4	
Number & Place Value	Tenths, hundredths Decimal (places) Round (to nearest) Thousand more/less than Negative integers Count through zero Roman numerals (I to C)
Multiplication & Division	Multiplication facts (up to 12x12) Division facts Inverse Derive
Year 5	
Number & Place Value	Powers of 10
Addition & Subtraction	Efficient written method
Multiplication & Division	Factor pairs Composite numbers, prime number, prime factors, square number, cubed number Formal written method
Year 6	
Number & Place Value	Numbers to ten million
Addition & Subtraction	Order of operations BIDMAS (Brackets, Indices, Division, Multiplication, Addition, Subtraction)
Multiplication & Division	Order of operations BIDMAS (Brackets, Indices, Division, Multiplication, Addition, Subtraction)Common factors, common multiples

Kiwi Primary School Calculation Policy: DIVISION

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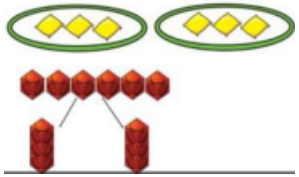
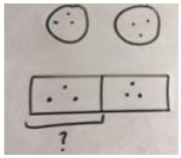
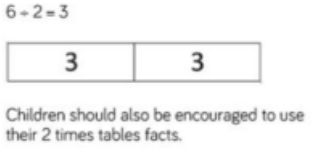
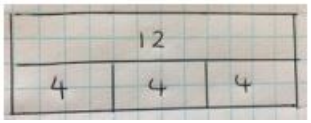
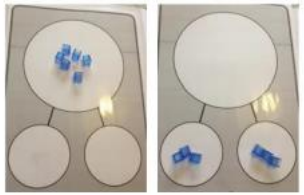
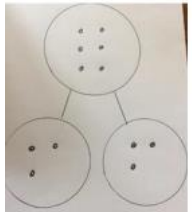
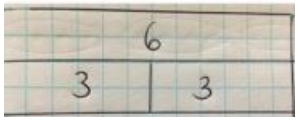
Year 1 Representation models used in year 1 : cubes, bead strings, part whole model, bar model			
Objective/Strategy	Concrete	Pictoral	Abstract
Sharing	Using a range of objects 	Children to represent the practical resources 	Use a bar model 
Grouping	Using a bead string 	Represent this pictorially alongside a number line 	Use a bar model 
Halving even numbers	Using cubes 	Representing pictorially 	Using a bar model 

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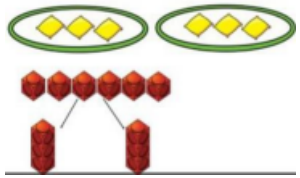
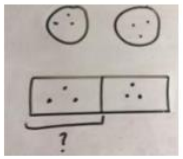
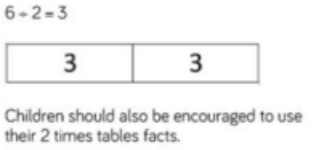
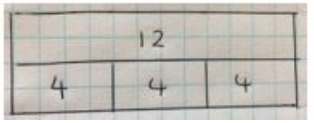
STEM Sentences	The whole is_____. The whole is shared into ___ equal parts. Each part is worth _____.

Year 2 Representation Models used: counter, cubes, bead strings, part whole model, bar model			
Objective/Strategy	Concrete	Pictoral	
Sharing	Using a range of objects 	Children to represent the practical resources 	Use a bar model 
Grouping	Using a bead string 	Represent this pictorially alongside a number line 	Use a bar model 

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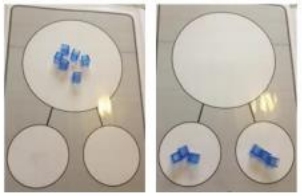
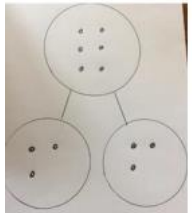
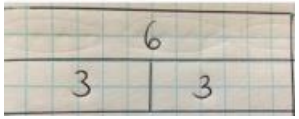
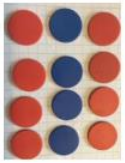
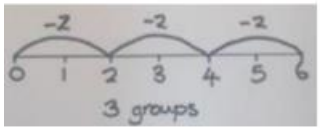
Halving even numbers	Using cubes 	Representing pictorially 	Using a bar model 
Arrays Using cubes/counters Represent pictorially Using a bar model	Using cubes/counters 	Represent pictorially 	Using a bar model 
Repeated subtraction	Use concrete resources 	Represent pictorially 	Abstract number line to represent the equal groups that have been subtracted 
<u>STEM Sentences</u>	The whole is_____. The whole is shared into ___ equal parts. Each part is worth ____.		

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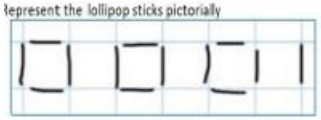
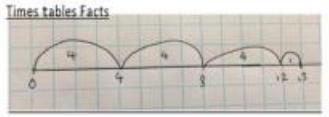
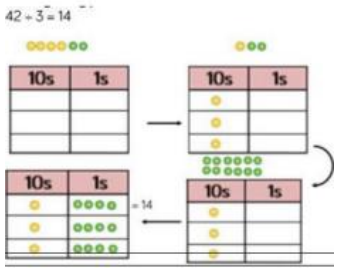
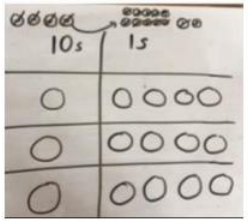
Year 3

Representation models used in year 3 : Counters, bead strings, number lines, place value chart

Objective/Strategy	Concrete	Pictoral	
To ÷ with remainders	Using resources  13 ÷ 4 Use of lollipop sticks to form wholes- squares are made because we are dividing by 4.  There are 3 whole squares, with 1 left over.	Represent this pictorially alongside a number line  Represent the lollipop sticks pictorially 	Children are encouraged to use their times tables facts and knowledge of inverse. Represent repeated addition on a number line 
Sharing	Using counters 	Represented pictorially 	Calculations to show steps 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14
STEM Sentences	The whole is_____. The whole is shared into ___ equal parts. There are ___ equal parts of ___ and _____ remainders		

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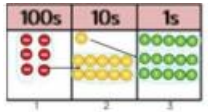
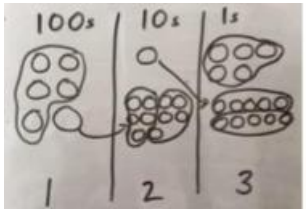
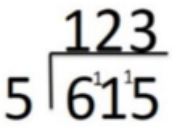
Year 4 Representation models used in: Counters, bead strings, number lines, place value chart			
Objective/Strategy	Concrete	Pictoral	
Short division	With place value counters 	Represent the counters pictorially 	Short division scaffold to calculate 
STEM Sentences	The whole is_____. The whole is shared into ___ equal parts. There are ___ equal parts of ___ and _____ remainders		

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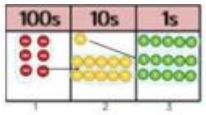
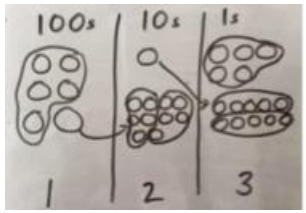
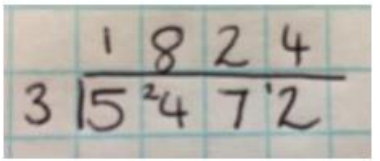
Year 5

Representation models used: Counters, bead strings, number lines, place value chart

Objective/Strategy	Concrete	Pictoral	
Short division	With place value counters 	Represent the counters pictorially 	Formal Method 

STEM Sentences	
	The whole is_____.
	The whole is shared into ___ equal parts.
	There are ___ equal parts of ___ and _____ remainders
	The quotient of ___ and ___ is _____ (the quotient of 24 and 6 is 4)
	The dividend is_____, the divisor is_____, the quotient is_____.

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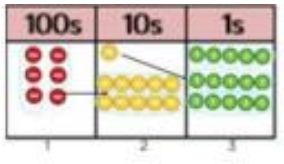
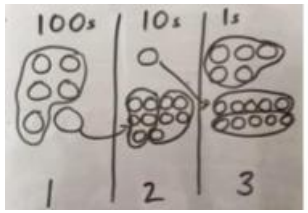
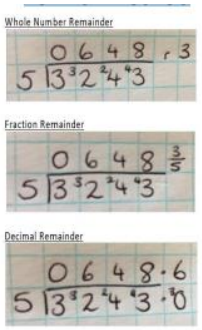
Year 6

Representation models used : Counters, bead strings, number lines, place value chart

Objective/Strategy	Concrete	Pictoral	
Short division Interpret remainders as whole numbers, fractions or decimals	Use place value counters 	Represent the counters pictorially 	Formal method 

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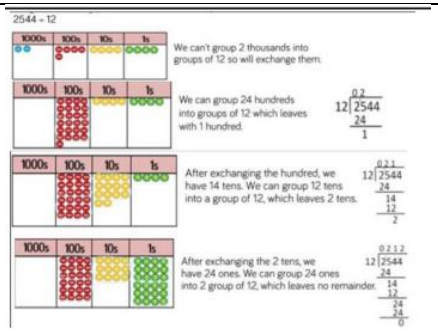
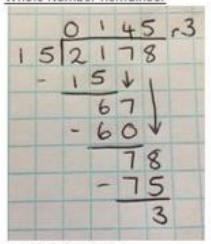
Long division

Interpret remainders as whole numbers, fractions or decimals

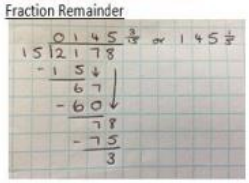


Formal written methods

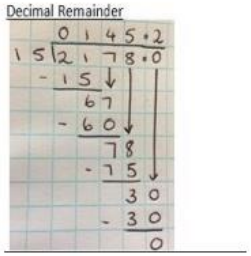
Whole Number Remainder



Fraction Remainder



Decimal Remainder



STEM Sentences

The whole is_____.

The whole is shared into ___ equal parts.

There are ___ equal parts of ___ and _____ remainders

The quotient of ___ and ___ is _____ (the quotient of 24 and 6 is 4)

The dividend is_____, the divisor is_____, the quotient is_____.

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