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
Multiplication & Division	Product Multiples of four, eight, fifty and one hundred

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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: SUBTRACTION

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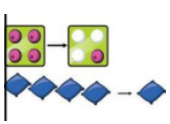
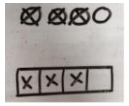
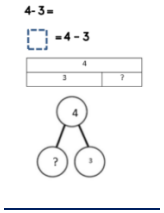
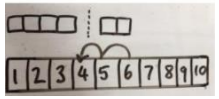
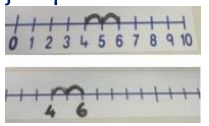
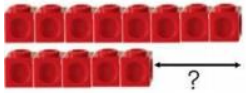
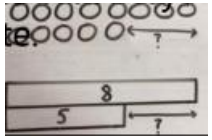
Year 1 Representation models used in year 1 : Bar model, part whole model, ten frames, cubes, numicon, Cuisinaire rods, number tracks, number lines			
Objective/Strategy	Concrete	Pictoral	Abstract
Physically taking away and removing objects from a whole.	Tens frame, Numicon, cube and other items such as bean bags could be used.  	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.  	
Counting back	Using number lines or number tracks –children start with 6 and count back 2 	Children to represent what they see pictorially 	Children to represent the calculation on a number line or number track and show their jumps. 
Finding the difference.	Using cubes, Numicon or Cuisinaire rods, other objects can also be used. 	Children to draw the cubes/ other concrete objects which they have used or the bar model to illustrate that they need to calculate. 	8 – 5, the difference is ☐ Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference.

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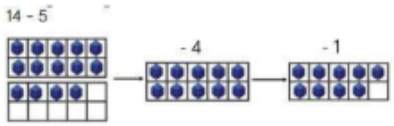
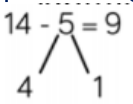
Making 10	Using ten frames 	Children to present the ten frame pictorially and discuss what they did to make 10. 	Children to show how they can make 10 by partitioning the subtrahend.  14 - 4 = 10 10 - 1 = 9
STEM Sentences	The whole is_____ so _____ is a part and _____ is a part _____ is a part and _____ is a part so _____ is a whole The difference between ___ and ___ is ___		

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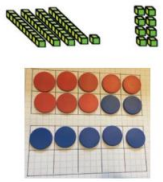
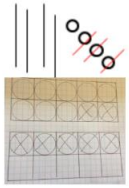
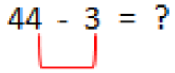
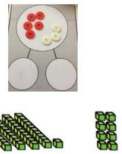
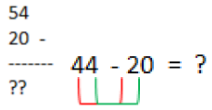
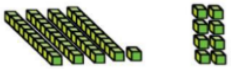
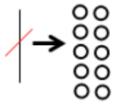
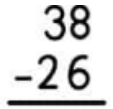
<table>
<tr><th colspan="4">Year 2
Representation models used in year 2 : Part-whole, bar model, number line, ten frame, base 10 (dienes), place value chart</th></tr>
<tr><th>Objective/Strategy</th><th>Concrete</th><th colspan="2">Pictoral</th></tr>
<tr><td>2-digit – 1s</td><td>Use concrete resources
  </td><td>Represent the resources
  </td><td>Use number fact knowledge, join the ones (smiles), number line
  </td></tr>
<tr><td>2-digit – 10s</td><td>Place value counters/dienes
  </td><td>Represent resources using lines for tens and circles for ones
  </td><td>Answer a question by using partitioning or column subtraction
  </td></tr>
<tr><td>Two digit number subtract a two digit number</td><td>Use manipulatives to understand exchanging 1 ten exchanges for ten ones.
  </td><td>Represent resources by crossing out and exchanging place value
  </td><td>As above:
  </td></tr>
<tr><td colspan="2">STEM Sentences</td><td colspan="2">The whole is_____ so _____ is a part and _____ is a part
(The whole is 10 so 6 is a part and 4 is a part)

____ is a part and ____ is a part so ____ is a whole
(7 is a part and 3 is a part so 10 is the whole)</td></tr>
</table>

	The difference between ___ and ___ is ___ (The difference between 12 and 4 is 8).

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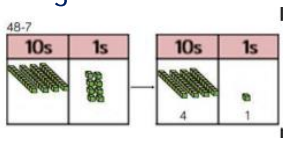
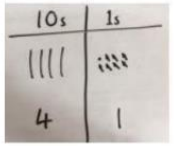
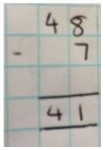
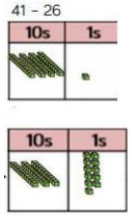
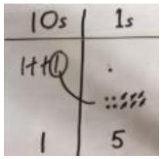
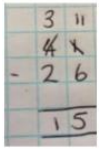
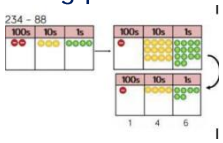
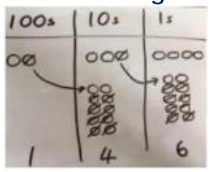
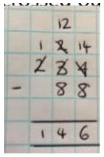
<table>
<tr><th colspan="4">Year 3
Representation models used in year 3 : Dienes, place value chart, column subtraction</th></tr>
<tr><th>Objective/Strategy</th><th>Concrete</th><th colspan="2">Pictoral</th></tr>
<tr><td>Column method
TO - O</td><td>Using dienes
  </td><td>Children to represent the base 10 pictorially.
  </td><td>Column method or children could count back 7.
  </td></tr>
<tr><td>Column method
TO - TO</td><td>Using base 10 and having to exchange
  </td><td>Represent the base 10 pictorially, remembering to show the exchange
  </td><td>Formal column method. Children know that when they have exchanged the 10 they still have 41 because 41 = 30 +11
  </td></tr>
<tr><td>Column method
HTO - TO</td><td>Using place value counters.
  </td><td>Represent the place value counters pictorially; remembering to show what has been exchanged.
  </td><td>Formal column method. Children must understand what has happened when they have crossed out digits.
  </td></tr>
<tr><td colspan="2">Stem Sentences</td><td colspan="2">The whole is_____ so _____ is a part and _____ is a part
(The whole is 10 so 6 is a part and 4 is a part)

_____ is a part and _____ is a part so _____ is a whole

The difference between ___ and ___ is ___</td></tr>
</table>

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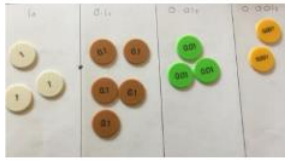
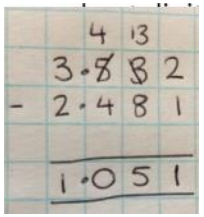
<table>
<tr><th colspan="4">Year 4
Representation models used in year 4 : Place value counters, place value chart, column subtraction</th></tr>
<tr><th>Objective/Strategy</th><th>Concrete</th><th colspan="2">Pictoral</th></tr>
<tr><td>Column method 4-digit – up to 4-digit</td><td>Using place value counters
  </td><td>Represent the place value counters pictorially; remembering to show what has been exchanged.
  </td><td>Formal column method. Children must understand what has happened when they have crossed out digits.
  </td></tr>
<tr><td colspan="2">STEM Sentences</td><td colspan="2">The whole is_____ so _____ is a part and _____ is a part
(The whole is 10 so 6 is a part and 4 is a part)

_____ is a part and _____ is a part so _____ is a whole

The difference between ___ and ___ is ___</td></tr>
</table>

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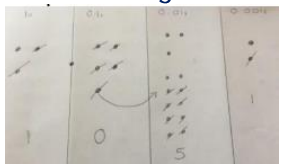
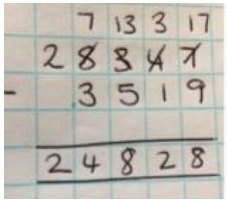
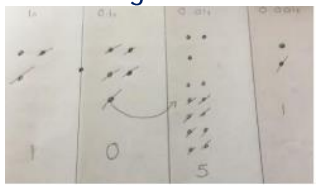
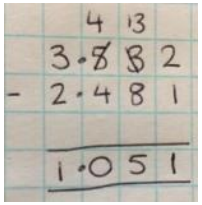
Year 5

Representation models used in year 5 : Place value counters,place value denes, place value chart, column subtraction

Objective/Strategy	Concrete	Pictoral	
Column method- Integers	Using place value counters 	Represent the place value counters pictorially; remembering to show what has been exchanged. 	Formal column method. Children must understand what has happened when they have crossed out digits. 
Column method – decimals (same number up to 3 d.p)	Using place value counters 	Children to represent the counters in a place value chart, circling when they make an exchange. 	Formal column method. Children must understand what has happened when they have crossed out digits. 

STEM Sentences	The whole is_____ so _____ is a part and _____ is a part (The whole is 10 so 6 is a part and 4 is a part) ____ is a part and ____ is a part so ____ is a whole The difference between ___ and ___ is ___

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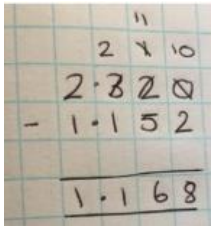
<table>
<tr><th colspan="4">Year 6
Representation models used in year 6 : Place value counters, place value denes, place value chart, column subtraction</th></tr>
<tr><th>Objective/Strategy</th><th>Concrete</th><th colspan="2">Pictoral</th></tr>
<tr><td>Column method – decimals (different number up to 3 d.p)</td><td>Use place value counters
  </td><td>Children to represent the counters in a place value chart, circling when they make an exchange.
  </td><td>Formal column method. Children must understand what has happened when they have crossed out digits.
  </td></tr>
<tr><td colspan="2">STEM Sentences</td><td colspan="2">The whole is_____ so _____ is a part and _____ is a part
(The whole is 10 so 6 is a part and 4 is a part)

____ is a part and ____ is a part so ____ is a whole

The difference between ___ and ___ is ___</td></tr>
</table>