Mathletics

New Zealand Curriculum

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Content

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Mathletics and the New Zealand Curriculum

The education team at Mathletics is committed to providing a resource that is powerful, targeted and most importantly, relevant to all students.

Mathletics includes well over 1,200 individual adaptive practice activities and eBooks available for all grades. Our team of education publishers have created a course that specifically follows the New Zealand curriculum. You can be assured that students have access to relevant and targeted content.

Strands, sub-strands and learning outcomes of the curriculum are supported with activities, each with pre and post assessment. What's more, Mathletics contains an extensive library of eBooks – for use on screen or as a printable resource – that are also mapped to the requirements of the New Zealand curriculum.

This document outlines this mapping and acts as a useful guide when using Mathletics in your school.

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New Zealand Algebra Level 1

AO	Activities Name	Description
NA1-1	**Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions.**	
	WHOLE NUMBER/PLACE VALUE	
	Number Line Order	Place five given numbers in order on a number line. Easier: numbers go up by ones, Medium: numbers go up by twos, Harder: numbers go up by fives.
	Making Big Numbers Count	Model a given two-digit number using place value blocks of tens and ones.
	Counting by Twos	Numbers up to 100. Easier = 5 numbers, Medium= 10 numbers, Harder = 15 numbers. Choose the odd one out (which one doesn't count in 2s).
	Counting by Fives	Click on the odd number out - multiples of 5. Nothing over 100.
	Groups of Two	Determine the number of groups of two dots and the total number of dots in an array in which each row has two dots. Answers written as '__ groups of 2 = __'. No use of × symbol.
	Grouping in Fives	Determine the number of groups of five dots and the total number of dots in an array in which each row has five dots. Answers written as '__ groups of 5 = __'. No use of × symbol.
	Groups of Five	Determine the number of groups of five dots and the total number of dots in an array in which each row has five dots. Answers written as '__ groups of 5 = __'. No use of × symbol.
	Grouping in Tens	Determine the number of groups of ten dots and the total number of dots in an array in which each row has ten dots. Answers written as '__ groups of 10 = __'. No use of × symbol.
	Groups of Ten	Determine the number of groups of ten dots and the total number of dots in an array in which each row has ten dots. Answers written as '__ groups of 10 = __'. No use of × symbol.
	How Many Dots?	Click on a card to reveal a dot pattern momentarily and record the number of dots. Total number of dots must lie between 1 and 12.
	Doubles and Halves to 20	Find double or half of whole numbers up to twenty.
	Place Value 1	Write the 2-digit number. An abacus is shown with tens and ones.
	Repartition Two-digit Numbers	Non-standard partitioning of a 2-digit number into tens and ones.
	More, Less or the Same to 10	Compare counters arranged in two or three 'ten frames' to determine who has 'more than, the same as, or less than'. Counters may be moved within ten frame. Numbers between 1 and 10 only.
	Doubles and Halves to 10	Find double or half of whole numbers up to ten - counters on tens frames shown.

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New Zealand Number Level 1

AO	Activities Name	Description
NA1-1	**Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions.**	
	WHOLE NUMBER/PLACE VALUE	
	Greater or Less to 100	Determine which 2-digit number is 'greater' or 'less'. Given numbers are accompanied by images of place value blocks.
	Count by 2s, 5s and 10s	Drag numbers on to a number line to complete the sequence of whole numbers. Patterns increase by 2, 5, and 10.
	Odd or Even	Determine the number of counters, when the counters are arranged in 2 rows in pairs, and then determine whether the number is 'odd' or 'even'. Numbers between 1 and 20 only.
	Compare numbers to 50	using < and > comparing numbers with place value blocks showing as well
	Recognise Everyday Money (NZD)	All NZD notes and coins included. Select one note or coin that matches the given amount. Students will need to know the symbols $ and c. Whole number amounts only. No decimals used.
	Count by Tens	Fill in the missing numbers - counting in tens.
	FRACTIONS	
	Share the Treasure	Drag items into two, three or four groups of equal size. No remainders. No numbers or symbols used.
	Halves	Easier = shade half a shape, Medium= fill half of a small number frame with dots, Harder = fill half of a slightly larger number frame with dots.
	Is it Half?	Decide whether half an object has been shaded or whether a small group of counters has been divided in half.
	Shade fractions	Shade either 1/2, 1/3 or 1/4 of a shape that is presented with the correct number of equal parts.
	Halves and Quarters	Shade halves or quarters of shapes only uses 1/2, 1/4 and 3/4
	ADDITION AND SUBTRACTION	
	Model Subtraction	Subtract two numbers to obtain their difference by counting back from the first number which is shown on a number line or by observing the two groups of objects above the difference statement. Maximum number given is 10. Result is never 0. Once the answer has been submitted, the jumps are shown on the number line. Symbols – and = are used.
	Subtraction Facts to 18	Subtract two numbers to obtain their difference by counting back from the first number which is shown on a number line or by observing the two groups of objects above the difference statement. Maximum number given is 18. Result is never 0. Once the answer has been submitted, the jumps are shown on the number line. Symbols – and = are used.

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New Zealand Number Level 1

AO	Activities Name	Description
NA1-1	**Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions.**	
	ADDITION AND SUBTRACTION	
	Adding to 5	Addition of two 1-digit numbers so that the sum is either 2, 3, 4 or 5. A number line from 0 to 5 is shown. Jumps appear on the number after you have submitted your answer.
	Subtracting from Ten	Subtract two numbers to obtain their difference by counting back from the first number which is shown on a number line above the difference statement. All numbers less than or equal to 10. Once the answer has been submitted, the jumps are shown on the number line. Symbols +, – and = are used.
	Subtracting From 5	Subtraction of two 1-digit numbers 1, 2, 3, 4 or 5 so that the difference is either 1, 2, 3 or 4. A number line from 0 to 5 is shown. Jumps appear on the number after you have submitted your answer.
	Adding to 10 Word Problems	Word problems involving number sentences with addition. Number sentences can be of the form # + # = ☐ or ☐ + # = # Students must drag images of objects/animals to show the correct sum before they submit the answer. Sums of 10 or less.
	Add and Subtract Problems	Use of tens frames to help solve word addition and subtraction problems.
	Subtract Tens	Place value blocks used to help subtract tens from tens.
NA1-2	**Know the forward and backward counting sequences of whole numbers to 100.**	
	Arranging Numbers	Compare the relative size of two whole numbers of up to 2-digits and place them in boxes labelled 'smallest' and 'largest'.
	1 to 30	Order numbers from 1 to 30. Easier: order numbers from 1 to 10, Medium: order numbers from 11 to 20, Harder: order numbers from 21 to 30.
	Reading Numbers to 30	Given a number between 1 and 30 in words, determine the numeral that represents it. Easier: numbers between 1 and 10, Medium: numbers between 11 and 19, Harder: numbers between 20 and 29.
	Counting Backwards	Count backwards from a number between 1 and 30.
	Counting Forwards	Count forwards from a number between 1 and 30, up to a maximum of 30.
	Going Up	Count forwards from a number between 1 and 100, up to a maximum of 100.
	Going Down	Count backwards from a number between 1 and 100, up to a maximum of 100.
	Number Lines	Place a marker onto a number line to represent a given number of up to 2 digits.

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New Zealand Number Level 1

AO	Activities Name	Description
NA1-2	**Know the forward and backward counting sequences of whole numbers to 100.**	
	The Number Line	Place a marker onto a number line to represent a given number of up to 2 digits. Adaptive: all numbers are showing on the number for the Easier questions.
	Order Numbers to 10	Place the correct numeral on the blank card in the forwards number sequence of five 1-digit numbers. Number sequence goes up by ones and may start on any digit from 1 to 5.
	Order Numbers to 20	Place the correct numeral on the blank card in the forwards number sequence of five numbers between 11 and 20. Number sequence goes up by ones and may start on any digit from 11 to 15.
	Compare Numbers to 20	Place one of the symbols < or > between two numbers less than or equal to 20. A set of objects shown in rows is used to assist in comparing the numbers.
	Compare Numbers to 100	Place one of the symbols < or > between two numbers less than or equal to 100. Each number is accompanied by an image of place blocks of tens and ones to assist in comparing the numbers.
	Count to 5	Select the numeral from 1, 2, 3, 4, 5 that represents the number of items shown. Items shown in a line, and numbers 1 to 5 aligned directly underneath each item.
	Matching Numbers to 20	Given a number of beads arranged in groups of tens and ones, select the number and the number word for the number of beads. Numbers between 10 and 20 only.
	Concept of Zero	Select the object that contains 'zero' items.
	Before, After and Between to 20	Easier = write the number immediately after one given number, Medium=write the number immediately before one given number, Harder =write the number between two given numbers
	Before, After & Between to 100	Easier = write the number before, Medium= the number after, Harder = the number between.
	1 More, 10 Less	Determine the number that is '1 more than' or '10 less than' the given 2-digit number. Given number is accompanied by an image of place value blocks.
	1 More, 2 Less	Determine the number that is '1 more than', '2 more than', '1 less than' or '2 less than' the given 1- or 2-digit number. Given number is accompanied by an image of place value blocks. Given numbers are less than 20.
	More, Less or the Same to 20	Compare counters arranged in two or three '10 frames' to determine who has 'more than, the same as, or less than' or who has 'most' or 'least'. Counters may be moved within ten frame. Numbers between 1 and 20 only.

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New Zealand Number Level 1

AO	Activities Name	Description
NA1-2	**Know the forward and backward counting sequences of whole numbers to 100.**	
	Counting to 20	Easier = write one number after, Medium= write two numbers after, Harder = write three numbers after.
	Counting back within 20	Easier = write one number before, Medium= write two numbers before, Harder = write three numbers before.
NA1-3	**Know groupings with 5, within 10 and with 10.**	
	Making Numbers Count	Determine the value of the number represented by place value blocks of tens and ones. Easier= 1 ten and ones, Medium= 2 tens and ones, Harder= 3 tens and ones.
	Adding to Make 5 and 10	Drag and drop the counters to add up to 5 or 10 with frames.
	Making Teen Numbers	Using tens frames to make numbers up to 20 with counters
	Dot Display	Quickly recognise patterns of dots up to the value of 6.

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New Zealand Number Level 2

AO	Activities Name	Description
NA2-1	Use simple additive strategies with whole numbers and fractions.	
	MULTIPLICATION AND DIVISION	
	Multiplication Arrays	Given an array of dots, complete the statement '__ rows of __ = __'. Easier= multiplication by 2, 3, Medium= multiplication by 4, 5, 6, Harder= multiplication by 7, 8, 9, 10.
	Grouping in Twos	Determine the number of groups of two dots and the total number of dots in an array in which each row has two dots. Answers written as '__ groups of 2 = __'. No use of × symbol.
	Grouping in Threes	Determine the number of groups of three dots and the total number of dots in an array in which each row has three dots. Answers written as '__ groups of 3 = __'. No use of × symbol.
	Groups of Three	Determine the number of groups of three dots and the total number of dots in an array in which each row has three dots. Answers written as '__ groups of 3 = __'. No use of × symbol.
	Grouping in Fours	Determine the number of groups of four dots and the total number of dots in an array in which each row has four dots. Answers written as '__ groups of 4 = __'. No use of × symbol.
	Groups of Four	Determine the number of groups of four dots and the total number of dots in an array in which each row has four dots. Answers written as '__ groups of 4 = __'. No use of × symbol.
	Dividing Twos	Determine the number of dots in each group when they are shared equally between two. Dots presented as an array with two rows. Answers written as '## shared between 2 = __ each'. No use of ÷ symbol.
	Dividing by Two	Determine the number of dots in each group when they are shared equally between two. Dots presented as an array with two rows. Answers written as '## shared between 2 = __ each'. No use of ÷ symbol.
	Dividing Fives	Determine the number of dots in each group when they are shared equally between five. Dots presented as an array with five rows. Answers written as '## shared between 5 = __ each'. No use of ÷ symbol.
	Dividing by Five	Determine the number of dots in each group when they are shared equally between five. Dots presented as an array with five rows. Answers written as '## shared between 5 = __ each'. No use of ÷ symbol.
	Dividing Tens	Determine the number of dots in each group when they are shared equally between ten. Dots presented as an array with ten rows. Answers written as '## shared between 10 = __ each'. No use of ÷ symbol.
	Dividing Threes	Determine the number of dots in each group when they are shared equally between three. Dots presented as an array with three rows. Answers written as '## shared between 3 = __ each'. No use of ÷ symbol.

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New Zealand Number Level 2

AO	Activities Name	Description
NA2-1	**Use simple additive strategies with whole numbers and fractions.**	
	MULTIPLICATION AND DIVISION	
	Dividing by Three	Determine the number of dots in each group when they are shared equally between three. Dots presented as an array with three rows. Answers written as '## shared between 3 = __ each'. No use of ÷ symbol.
	Dividing Fours	Determine the number of dots in each group when they are shared equally between four. Dots presented as an array with four rows. Answers written as '## shared between 2 = __ each'. No use of ÷ symbol.
	Divide Into Equal Groups	Given the number of marbles (as a numeral, e.g. '2') that each jar can hold, drag marbles into jars to determine the number of jars that are needed.
	Model multiplication to 5 x 5	Shade the appropriate rows and columns of a 5 × 5 grid to show the given multiplication fact and then calculate the answer. Uses × symbol but also 'rows of' to express the multiplication fact.
	Frog Jump Multiplication	Easier= given the size of a jump (2, 3, 5 or 10) and the number of jumps (1 to 10), Calculate where the frog will land using skip counting and jumps on the number line. Answer to be written as '# × # = __', Medium= given the size of a jump (2, 3, 5 or 10) and the final landing place, Calculate the number of jumps (1 to 10) needed. Answer written as '__ × # = #'. OR given a jump of 10 and the number of jumps (8, 9 or 10), Calculate where the frog will land using skip counting and jumps on the number line, Harder= similar to 'medium' but includes jumps of 5. Note: an empty number line is used (i.e. no values are shown on the number line except zero).
	Multiplication Problems 1	Multiplication to 5 x 5 or to x 10 when the other factor is 5 or 10. Various word problems are given. Students need to model the problem using the objects given in the problem, Harder questions require students to calculate the factors from the product.
	Groups	Students are asked to consider three core elements of grouping multiplication: How many groups? How many objects in each group? Are the groups equal? They must identify which element each question is seeking.
	Arrays 1	Students use arrays to help identify a missing factor in a multiplication fact and to then calculate the product. The range is 2x, 5x, 10 x to 10th multiple and 3x, 4x to 5th multiple. At Easier level students may click the rows to reveal the entire array; at the Harder level students are only given 1 row and they must use mental strategies to solve the problem.
	Arrays 2	Students use an array model to complete a multiplication fact. This fact is drawn from the range: 2,3,4,5,6,10 x 1-5. Once the answer is submitted, feedback is given and the array is modified; one or two rows or columns are added or subtracted or the array is doubled. Students use the original fact to complete the second fact.

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AO	Activities Name	Description
NA2-1	**Use simple additive strategies with whole numbers and fractions.**	
	MULTIPLICATION AND DIVISION	
	Frog Jump Division	How many jumps will it take the frog to get back to zero on a number line from a given number? Easier = 2, 5, 10 times table facts, Medium = includes 3 times tables, Harder = number of jumps given and value of the jumps given - where did the frog start?
	Fill the Jars	Given the number of marbles (as a word, e.g. 'two') that each jar can hold, drag marbles into jars to determine the number of jars that are needed.
	FRACTIONS	
	Fractions of a Collection 1	Use an interactive to find the fraction of an amount by partitioning a rectangle into the appropriate fractions and placing counters in the sections. Easier = e.g. 1/2, Medium= e.g. 1/3, Harder = e.g. 3/4
	Fractions of a Collection	Highlight objects to reflect the given fraction. E.g. 2/6 of 12.
	ADDITION AND SUBTRACTION	
	All about Twenty	Determine the missing addend/subtrahend or sum/difference in a number sentence of addition or subtraction of 1-digit and 2-digit numbers. The sum of the numbers is no larger than 20. Number statements are written horizontally: # ± # = ☐ or # ± ☐ = #. Once the answer has been submitted, the jumps are shown on the number line. Symbols +, – and = are used.
	Adding In Any Order	Uses countable groups of objects to demonstrate that the sum of two 1-digit numbers is the same, no matter which order the addends are written in, i.e. 3 + 4 = 4 + 3. Students need to enter a number to complete each of the two number sentences under each diagram. Uses symbols + and =.
	What's the Change? (NZD)	Given a New Zealand bank note ($5, $10 or $20) and the price tag of an item to purchase, calculate the amount of change. Whole number amounts up to 20 only. Uses symbols $ and – and =.
	Columns that Add	Add one or two 1-digit numbers to a 1- or 2-digit number displayed in the vertical algorithm format, i.e. up to three numbers being added. No carrying required at any level. Easier = add two 1-digit numbers of 4 or less, maximum sum= 8, Medium= add three 1-digit numbers of 4 or less, maximum sum= 8, Harder= add one 2-digit number to two 1-digit numbers, maximum sum= 49.
	Add Three 1-Digit Numbers	Add three 1-digit numbers by adding to 10 first. (Make ten)
	Add Two 2-Digit Numbers	Add two 2-digit numbers displayed in the vertical algorithm format. No carrying required for either ones or tens. Maximum sum= 79.

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New Zealand Number Level 2

AO	Activities Name	Description
NA2-1	**Use simple additive strategies with whole numbers and fractions.**	
	ADDITION AND SUBTRACTION	
	Columns that Subtract	Subtract a 1-digit or 2-digit number from a 2-digit number displayed in the vertical algorithm format. Borrowing from the tens column is not required. Easier= subtract a 1-digit number (1 to 8) from a 1-digit number (2 to 9), Medium= subtract a 1-digit number (1 to 9) from a 2-digit number (42 to 98), Harder= subtract a 2-digit number (12 to 98) from a 2-digit number (21 to 98).
	2-Digit Differences	Subtract a 2-digit number (11 to 38) from a 2-digit number (21 to 98) displayed in the vertical algorithm format. No borrowing.
	3-Digit Differences	Subtract a 3-digit number from another 3-digit number displayed in the vertical algorithm format. Borrowing never required.
	Add Three 2-Digit Numbers	Add three 2-digit numbers displayed in the vertical algorithm format to obtain a 2-digit answer. Carrying never required.
	Related Facts 1	Family of facts - addition and subtraction.
	Subtract Numbers	Subtract a 2-digit from a 2-digit number displayed in the vertical algorithm format accompanied by place value blocks to model the situation. All answers are 2-digit numbers. Borrowing from the tens column is not necessary. Easier= subtract a 2-digit number (11 to 38) from a 2-digit number (22 to 49), Medium= subtract a 2-digit number (11 to 58) from a 2-digit number (25 to 69), Harder= subtract a 2-digit number (12 to 48) from a 2-digit number (55 to 99).
	Subtract Numbers: Regroup	Subtract a 2-digit from a 2-digit number displayed in the vertical algorithm format accompanied by place value blocks to model the situation. All answers are 2-digit numbers. Borrowing from the tens column is not necessary. Easier= subtract a 2-digit number (11 to 38) from a 2-digit number (22 to 49), Medium= subtract a 2-digit number (11 to 58) from a 2-digit number (25 to 69), Harder= subtract a 2-digit number (12 to 48) from a 2-digit number (55 to 99).
	Add 3 Single Digit Numbers	Numbers are shown horizontally. They can be moved around to make easier additions.
	Complements to 10, 20, 50	Count on to find how much more to add to 10, 20, 50 (at 50 students are encouraged to use tidy numbers).
	Bar Model Problems 1	Addition and subtraction word problems involving calculating with the whole or the part using a bar model. All values are 1- and 2-digit numbers.
	Add 3 Numbers Using Bonds to 10	Add three 1-digit numbers that appear on blocks such that two of the numbers add to ten. The blocks can be moved so that two numbers that add to ten can be placed side-by-side. Make ten.
	Adding to 2-digit numbers	Add either a 1-digit and 2-digit number, or two 2-digit numbers by modelling the sum using place value materials.
	Doubles and Near Doubles	Doubles and near doubles sums with accompanying tens frames modelling.

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New Zealand Number Level 2

AO	Activities Name	Description
NA2-2	**Know forward and backward counting sequences with whole numbers to at least 1000.**	
	Greater Than or Less Than?	Place one of the symbols <, =, > between two numbers. Easier= two 2-digit numbers, Medium= two 3-digit numbers, Harder= two 4-digit numbers.
	Counting by Tens	Find the odd one out - numbers over 100 and not multiples of 5 and 10...patterns of counting up in tens.
	Put in Order 1	Order three numbers of 4 digits.
	10 More, 10 Less	Determine the number that is 10 more or less than a given 2-digit number.
	Converting from Roman Numerals to 1000	The support shows the roman numeral conversions.
	Converting to Roman Numerals to 100	The support shows the roman numeral conversions.
	Converting to Roman Numerals to 1000	The support shows the roman numeral conversions.
	Ascending Order	Place three, four or five numbers of up to 4 digits in ascending order.
	Descending Order	Place three, four or five numbers of up to 4 digits in descending order.
	Which Is Greater?	Select which number is 'greater' from a pair of numbers. Each pair of numbers has either two 3-digit numbers or two 4-digit numbers.
	Which Is Less?	Select which number is 'less' from a pair of numbers. Each pair of numbers has either two 3-digit numbers or two 4-digit numbers.
	Which is Bigger?	Select which number is 'bigger' from a pair of numbers. Easier= two 2-digit numbers, Medium= one 2-digit number and one 3-digit number, Harder= two 3-digit numbers.
	Which is Smaller?	Select which number is 'smaller' from a pair of numbers. Easier: two 2-digit numbers, Medium: one 2-digit number and one 3-digit number, Harder: two 3-digit numbers.
NA2-3	**Know the basic addition and subtraction facts.**	
	All about Ten	Determine the missing addend or sum/difference in a number sentence of addition or subtraction of two numbers. The first number is shown on a number line above the sum/difference. The sum of the numbers is no larger than 10. Number statements are written horizontally: # ± # = ☐ or # ± ☐ = #. Once the answer has been submitted, the jumps are shown on the number line. Symbols +, – and = are used.
	Addictive Addition	Add two numbers. Sum of numbers is no larger than 19. Easier= (10 + # = ☐), Medium= (# + 10 = ☐), Harder= (# + # = ☐). Symbols +, – and = are used.

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New Zealand Number Level 2

AO	Activities Name	Description
NA2-3	**Know the basic addition and subtraction facts.**	
	Subtracting from 20	Subtract a number between 1 and 18 from a number between 10 and 19. All numbers less than or equal to 19. Symbols +, – and = are used.
	Simple Subtraction	Subtract a number between 1 and 19 from a number between 10 and 20. All numbers less than or equal to 20. Symbols +, – and = are used.
	Fact Families: Add and Subtract	Given three 1-digit numbers, select the number that completes each of four number sentences involving addition and subtraction. Missing number may be the sum or one of the addends.
NA2-4	**Know how many ones, tens, and hundreds are in whole numbers to at least 1000.**	
	Nearest 10?	Drag the number to the bucket showing the nearest ten. Numbers between 1 and 100 only.
	Nearest Ten?	Drag the number to the bucket showing the nearest ten. Numbers between 1 and 100 only.
	Numbers in Words	Write the numbers for the words given Easier= hundreds, Medium= thousands, Harder= tens of thousands.
	Place Value to thousands	Identify the digit in either the 'ones', 'tens', 'hundreds' and 'thousands' place in a number of up to 4 digits.
	Place Value - Thousands	Identify the digit in either the 'ones', 'tens', 'hundreds' and 'thousands' place in a number of up to 4 digits.
	Nearest 100?	Drag a number into the bucket that shows the nearest hundred.
	Nearest Hundred?	Drag a number into the bucket that shows the nearest hundred.
	Model Numbers	Determine the value of the number represented by place value blocks of hundreds, tens and ones. Numbers all less than 400.
	Place Value 2	Write the 3-digit number. An abacus is shown with hundreds, tens and ones.
	Place Value 3	Write the 4-digit number. An abacus is shown with thousands, hundreds, tens and ones.
	Greater Than or Less Than 1	Students place <, =, > between two numbers of up to 4 digits
	Partition and Rename 1	Non-standard partitioning of a 3-digit number into two parts, either hundreds and ones or tens and ones, and also rewrite as '# hundreds + # ones' or '# tens + # ones'. Easier: partition into hundreds and ones if hundreds part is given, Medium: partition into tens and ones if tens part is given, Harder: partition into tens and ones if ones part is given.
	Smallest and largest numbers	Make the 'smallest', 'largest', 'second smallest' number you can using 3 or 4 given digits.

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New Zealand Number Level 2

AO	Activities Name	Description
NA2-5	**Know simple fractions in everyday use**	
	Comparing Fractions 1	Compare circles with shaded parts and choose the one that is biggest.
	What Mixed Number Is Shaded?	State the fraction that matches the shaded parts on the given circles (all examples are mixed numbers).
	Model Fractions	Choose the correct model of proper fractions with denominators of 2, 3, 4, 5, 6, 7, 8.
	Partition into Equal Parts	Share cookies out fairly. E.g. share 3 cookies between 4 friends. Students need to choose the right 'cookie cutter' that will split the cookies into various fractions before sharing them out.
	Identifying Fractions on a Number Line	Count the number of segments between 0 and 1 on a number line and identify the corresponding fraction from a list of choices. In the Easier questions the choices are all like fractions.
	Compare Fractions 1a	Compare proper fractions with the same denominator by placing < or = or > between them.
	Compare Fractions 1b	Compare proper fractions with the same denominator by placing < or = or > between them.
	Part-Whole Rods 1	Line up rods against one whole to identify the fractional relationships. Easier = halves, Medium= quarters, harder = eighths.
	Make Fair Shares	Share cookies out fairly. Easier= the cookies can be easily shared out, Medium and Harder = the cookies will need to be split into fractions using a 'cookie cutter' before they can be shared out fairly.
	Uneven partitioned shapes 1	Select the portion of the shape that shows the given fraction. Includes halves, quarters, thirds sixths and eighths.
	Fraction Length Models 1	Calculate the length of a strip by comparing it to the given strip. A ruler is showing above the strips. For example, strip B is 1/2 of strip A - how long is it? Easier = uses fractions 1/2 and 1/4, Medium, includes 1/8, harder = strip B is a fraction of strip A and strip C is a fraction of strip B.
	Thirds and Sixths	Shade thirds and sixths of shapes.
	Add Subtract Fractions 1	Add or subtract two proper fractions with the same denominator using a circle/sector model. All answers are proper fractions and no answers require simplification.

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New Zealand Number Level 3

AO	Activities Name	Description
NA3-1	**Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.**	
	Halve it!	Find halves of numbers.
	I am Thinking of a Number!	Solve words problems such as 'when I add 3 to this number and double it I get 24'.
	Money - counting (NZ)	All NZD notes and coins included. Determine the amount of money shown. Amounts expressed as decimals.
	Magic Symbols 1	Find the value of each of three symbols that fill the nine spaces in a 3 by 3 magic square. Easier= all row/column totals are 2-digit numbers, Medium= row/column totals are 2- or 3-digit numbers, Harder= all row/column totals are 3-digit numbers.
	Partition Puzzles 1	Fill in the puzzle with missing addends or sums.
	Pyramid Puzzles 1	Use mental calculation and algebraic reasoning to enter missing numbers in the pyramid. Adaptive - additions get progressively harder.
	Convert from Roman Numerals	Convert from Roman numerals to Hindu-Arabic numerals.
	Convert to Roman Numerals	Convert Hindu-Arabic numerals to Roman numerals.
	ADDITION AND SUBTRACTION	
	Magic Mental Addition	Add two 2-digit whole numbers mentally. Numbers presented horizontally. The support encourages place value partitioning when adding. Jumps along the number line are shown.
	Magic Mental Subtraction	Subtract two 2-digit whole numbers mentally. Numbers presented horizontally. The support encourages place value partitioning when subtracting. Jumps along the number line are shown.
	Column Subtraction Method	Subtract a 1-digit or 2-digit number from a 2-digit number displayed in the vertical algorithm format. Borrowing from the tens column is necessary always, although students are never expected to borrow from a zero digit. Easier= subtract a 1-digit number (1 to 9) from a 2-digit number (20 to 58). Borrowing from the tens column always required, Medium= subtract a 2-digit number (12 to 48) from a 2-digit number (71 to 98). Borrowing from the tens column always required, Harder= subtract a 2-digit number (12 to 89) from a 3-digit number (111 to 998).
	Split Add and Subtract	Add using place value partitioning.
	Compensation - Add	Addition of 2- and 3- digit whole numbers with instruction to use the compensation strategy.
	Compensation - Subtract	Subtract by rounding one number to a tidy ten and then compensating.

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Mathletics

New Zealand Number Level 3

AO	Activities Name	Description
NA3-1	**Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.**	
	ADDITION AND SUBTRACTION	
	Add Numbers= Regroup a Ten	Add two 2-digit numbers displayed in the vertical algorithm format to obtain a 2-digit answer. Carrying from ones to tens column always required.
	Complements to 50 and 100	Enter the complement number that adds to 50 or 100.
	Add Multi-Digit Numbers 2	Add a 4- or 5-digit number to a 3- or 4-digit number displayed in the vertical algorithm format. Carrying from ones to tens, and from tens to hundreds, and from hundreds to thousands, and from thousands to ten-thousands always required.
	Estimate Sums	Estimate the addition of two 3-digit numbers by rounding to the nearest hundred and then adding to obtain an estimate. Uses symbols + and ≈.
	2-Digit Differences= Regroup	Subtract a 2-digit number (11 to 79) from a 2-digit number (30 to 98) displayed in the vertical algorithm format. Borrowing from the tens column always required.
	Add Two 2-Digit Numbers= Regroup	Add two 2-digit numbers displayed in the vertical algorithm format to obtain a 2-digit answer. Carrying from ones to tens column always required.
	Add 3-Digit Numbers	Add two 3-digit numbers displayed in the vertical algorithm format to obtain a 3-digit answer. Carrying never required.
	Estimate Differences	Estimate the subtraction of a 2-digit number from a 3-digit number by rounding to the nearest ten and then subtracting to obtain an estimate. Uses symbols – and ≈.
	3-Digit Differences with Zeros	Subtract a 3-digit number from another 3-digit number displayed in the vertical algorithm format. First number always has zero in the tens digit. Borrowing from a zero digit in the tens column is always required, thus must borrow from hundreds as well as tens.
	Bump Add and Subtract	Add and subtract by rounding to a tidy number. Easier= rounding and compensating (round down), Medium and Harder include equal additions.
	Jump Add and Subtract	Subtraction using place value partitioning.
	Bar Model Problems 2	Addition and subtraction word problems involving calculating with the whole or the part using a bar model. Students do not have to complete the bar model in order to submit their answer. All values are 1- and 2-digit numbers.
	Add 3 Numbers= Bonds to 100	Move numbers around to make easier additions e.g. make 100 first.

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Mathletics

New Zealand Number Level 3

AO	Activities Name	Description
NA3-1	**Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.**	
	MULTIPLICATION AND DIVISION	
	Greatest Common Factor	Find the 'GCF' greatest common factor of two or three numbers. Harder questions generally involve 3-digit numbers and GCF of 11 or 13.
	Multiply and Divide Problems 1	Students solve multiplication and division problems set in the context of market shopping. Multiplication problems draw from facts within the 10 x 10 range and the matching extended facts (e.g. 5 x 2, 5 x 20, 5 x 200). Division problems focus on halving and the numbers often associated with recipe measurements (e.g. 12, 24, 250 mL).
	Multiply 3 single-digit numbers	Multiply the three digits together. Move the numbers around to make it easier.
	Double and Halve to Multiply	Multiply a 2-digit number by a 1- or 2-digit number by halving one number and doubling the other until you get an expression that is easier to calculate. Halving and doubling can be recorded but does not have to be recorded.
	Problems= Times and Divide	Involves mostly easier multiplication and division problems however there are some involving 15. Students must choose whether it is a multiplication or a division problem before solving.
	Problems= Multiply and Divide	Choose whether it is a multiplication or a division problem before solving.
	Word Problems= Multiply and Divide	Read the word problem, choose the correct number sentence (multiplication or division) and solve the problem. Need to be able to multiply up to 15 by a single digit number. E.g. 7 x 15
	Dividing by 10, 100, 1000	Easier= divide whole numbers of up to 3-digits by 10, Medium= divide whole numbers of up to 5 digits by 100, Harder= divide whole numbers of up to 6 digits by 1000. Whole number answers only, no remainder.
	Multiplying by 10, 100, 1000	Multiply a 3-digit whole number by 10, 100 or 1000. Only 3-digit numbers.
	Multiply Multiples of 10	Multiply a 1-digit whole number by a multiple of 10 between 10 and 100, or by multiple of 100 between 100 and 1000.
	Multiplication Properties	Identify the property of arithmetic shown and then calculate the value of the expression. Properties are= 'commutative property of multiplication' and 'associative property of multiplication'. Note that brackets are used.
	Multiply More Multiples of 10	Multiply numbers of up to 3 digits by a multiple of 10
	Mental Methods Multiplication 1	Multiply 2-digit numbers by a 1-digit number or a multiple of ten; then multiply a 2-digit number up to 20 by either 9 or 11. Rounding and compensating + proportional adjustment used.
	Related Facts 2	Calculate the related multiplication and division facts. An interactive array allows students to use repeated addition to calculate the related fact. Easier = 2, 5 times tables, Medium= 3, 4 times tables, Harder = 6, 7 times tables.

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Mathletics

New Zealand Number Level 3

AO	Activities Name	Description
NA3-1	**Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages.**	
	FRACTIONS, DECIMALS AND PERCENTAGES	
	Mixed to Improper	Convert mixed to improper. Easier =wholes in the mixed fraction are only 1 or 2, Medium= wholes up to 5, Harder = 2-digit wholes.
	Mixed to Improper 1	Convert mixed to improper. Easier =wholes in the mixed fraction are only 1 or 2, Medium= wholes up to 5, Harder = 2-digit wholes.
	Improper to Mixed	Easier = convert to a mixed number with one whole only, Medium= use up to 12 times tables to convert to mixed numbers, Harder = larger numbers.
	Improper Fraction to Mixed Numeral	Convert improper fractions to mixed numerals with only one or two wholes.
	Unit Fractions	Calculate one third, one quarter or one fifth of a whole number. All answers are whole numbers found by using multiplication facts up to 12 x 12.
	Converting Mixed and Improper	Convert mixed numerals to improper fractions and vice versa
	Fractions of a Collection 2	Use an interactive to find the fraction of an amount by partitioning a rectangle into the appropriate fractions and placing counters in the sections. Easier = unit fractions, Medium= e.g. 2/3, Harder = e.g. 2/8
	Equivalent Fraction Wall 1	Use a fraction wall divided into halves, thirds, quarters, sixths and eighths to determine the missing numerator or denominator in a pair of equivalent fractions.
	Equivalent Fraction Wall 2	Use a fraction wall divided into halves, thirds, quarters, fifths, sixths, eighths, tenths and twelfths to determine the missing numerator or denominator in a pair of equivalent fractions.
	Fraction Fruit Sets 2	Show a given number of fruit using the fractions given, e.g. 18 pieces of fruit with 1/3 as pears and 2/3 as apples.
	Percents and Decimals	Convert percentages to decimals or vice versa. All percentages are whole numbers with two digits.
NA3-2	**Know basic multiplication and division facts.**	
	Grouping in Sixes	Determine the number of groups of six dots and the total number of dots in an array in which each row has six dots. Answers written as '__ groups of 6 = __'. No use of × symbol.
	Groups of Six	Determine the number of groups of six dots and the total number of dots in an array in which each row has six dots. Answers written as '__ groups of 6 = __'. No use of × symbol.
	Grouping in Sevens	Determine the number of groups of seven dots and the total number of dots in an array in which each row has seven dots. Answers written as '__ groups of 7 = __'. No use of × symbol.

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New Zealand Number Level 3

AO	Activities Name	Description
NA3-2	Know basic multiplication and division facts.	
	Groups of Seven	Determine the number of groups of seven dots and the total number of dots in an array in which each row has seven dots. Answers written as '__ groups of 7 = __'. No use of × symbol.
	Grouping in Eights	Determine the number of groups of eight dots and the total number of dots in an array in which each row has eight dots. Answers written as '__ groups of 8 = __'. No use of × symbol.
	Groups of Eight	Determine the number of groups of eight dots and the total number of dots in an array in which each row has eight dots. Answers written as '__ groups of 8 = __'. No use of × symbol.
	Grouping in Nines	Determine the number of groups of nine dots and the total number of dots in an array in which each row has nine dots. Answers written as '__ groups of 9 = __'. No use of × symbol.
	Groups of Nine	Determine the number of groups of nine dots and the total number of dots in an array in which each row has nine dots. Answers written as '__ groups of 9 = __'. No use of × symbol.
	Dividing by Four	Determine the number of dots in each group when they are shared equally between four. Dots presented as an array with four rows. Answers written as '## shared between 4 = __ each'. No use of ÷ symbol.
	Dividing Sixes	Determine the number of dots in each group when they are shared equally between six. Dots presented as an array with six rows. Answers written as '## shared between 6 = __ each'. No use of ÷ symbol.
	Dividing by Six	Determine the number of dots in each group when they are shared equally between six. Dots presented as an array with six rows. Answers written as '## shared between 6 = __ each'. No use of ÷ symbol.
	Dividing Sevens	Determine the number of dots in each group when they are shared equally between seven. Dots presented as an array with seven rows. Answers written as '## shared between 7 = __ each'. No use of ÷ symbol.
	Dividing by Seven	Determine the number of dots in each group when they are shared equally between seven. Dots presented as an array with seven rows. Answers written as '## shared between 7 = __ each'. No use of ÷ symbol.
	Dividing Eights	Determine the number of dots in each group when they are shared equally between eight. Dots presented as an array with eight rows. Answers written as '## shared between 8 = __ each'. No use of ÷ symbol.
	Dividing by Eight	Determine the number of dots in each group when they are shared equally between eight. Dots presented as an array with eight rows. Answers written as '## shared between 8 = __ each'. No use of ÷ symbol.
	Dividing Nines	Determine the number of dots in each group when they are shared equally between nine. Dots presented as an array with nine rows. Answers written as '## shared between 9 = __ each'. No use of ÷ symbol.

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New Zealand Number Level 3

AO	Activities Name	Description
NA3-2	**Know basic multiplication and division facts.**	
	Dividing by Nine	Determine the number of dots in each group when they are shared equally between nine. Dots presented as an array with nine rows. Answers written as '## shared between 9 = __ each'. No use of ÷ symbol.
	Multiplication Facts	Determine the answer to multiplication facts up to 12 × 12.
	Division Facts 1	Division facts based on multiplication facts with whole numbers up to 12 × 12
	Division Facts to Twelve	Division facts based on multiplication facts with whole numbers up to 12 × 12
	Remainders by Arrays	Division problems that have remainders. Dots are arranged to show groups and remainders.
	Remainders by Tables	Find the quotient and remainder (expressed as a whole number) to a simple division using division facts up to 12 × 12. Easier= divide by 2, 5, 10, Medium= divide by 4, 8, Harder= divide by 6, 7, 9.
	Fact Families= Multiply and Divide	Drag and drop the numbers to make the multiplication and division facts true.
	Multiply Decimals and Powers of 10	Multiply decimal numbers by 10, 100 and 1000.
	Venn Diagram 1	Place a set of nine numbers into a Venn diagram with two sets. Each set represents multiples of a particular number, e.g. multiples of 5 and multiples of 3.
	Times Tables	Solve multiplication facts to 10 x 10. Some questions require students to enter a missing factor.
	Missing Numbers= × and ÷ facts	Students identify the missing factor or dividend/divisor in a multiplication or division fact. Students may click the double arrow to see the problem in its inverse form. The facts are drawn from the 2 x, 3 x, 5 x, and 10 x tables at Easier level, the 4 x, 6 x and 8 x tables at Medium level and all facts to 10 x 10 at Harder level.
NA3-3	**Know counting sequences for whole numbers.**	
	Skip Counting	Identify two skip-counting patterns on a hundreds board.
	Missing Numbers 1	Place missing numbers in a 3 by 3 number grid (e.g. part of a hundreds square or thousands grid). Numbers of 3- or 4-digits.
	Missing Numbers 2	Place missing numbers in a 3 by 3 number grid. Numbers of 3- or 4-digits.
	Number Sequences Up to 1 Million	Complete number sequences with 6-digit numbers - adding up in 30s etc.
	Greater Than or Less?	Place one of the symbols <, =, > between two 7-digit numbers.

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New Zealand Number Level 3

AO	Activities Name	Description
NA3-4	**Know how many tenths, tens, hundreds, and thousands are in whole numbers.**	
	Numbers from Words to Digits 1	Write numbers expressed in words as digits. Easier level is 4-digit numbers; Medium is 5-digit numbers; Harder is 6-digit numbers.
	Expanding Numbers	Express whole numbers of 3 or 4 digits as the sum of its place values (e.g. 5768=500+700+60+8).
	Dividing Whole Numbers by 10, 100, 1000	Divide whole numbers of up to 3-digits by 10; divide whole numbers of up to 5 digits by 100; divide whole numbers of up to 6 digits by 1000. Whole number answers only, no remainders.
	Multiplying Whole Numbers by 10, 100, and 1000	Multiply a number in the hundreds by 10, 100 or 1000 (Easier = 10, Medium= 100, Harder = both plus by 1000).
	Nearest Whole Number	Round decimals to the nearest whole number; decimals in the hundredths.
	Comparing Decimals 1	Compare two or three decimals of up to 2 decimal places with a value of less than 1 to determine the decimal with the largest value.
	Place Value to Millions	Identify the digit that has a particular place value in a number of up to 7 digits. Easier= asks for 'ones', 'tens', 'hundreds' in a 3-digit number, Medium= asks for 'thousands', 'hundreds' or 'tens' in a 5-digit number, Harder= asks for 'hundreds', 'thousands', 'ten thousands', 'hundred thousands' or 'millions' in a 7-digit number.
	Place Value - Millions	Identify the digit that has a particular place value in a number of up to 7 digits. Easier= ask for 'ones', 'tens', 'hundreds' in a 3-digit number, Medium= asks for 'thousands', 'hundreds' or 'tens' in a 5-digit number, Harder= asks for 'hundreds', 'thousands', 'ten thousands', 'hundred thousands' or 'millions' in a 7-digit number.
	Expanded Notation	Write 5-digit numbers in expanded notation (as the sum of place values, e.g. 48713 = 40000+8000+700+10+3). No numbers other than 5 digits. No numbers with a zero digit.
	Rounding Numbers	Round numbers of up to 5 digits correct to the nearest ten, hundred or thousand. Easier= round 2- or 3-digit numbers to the nearest ten, Medium= round 3- or 4-digit numbers to the nearest hundred, Harder= round 5-digit numbers to the nearest thousand.
	Rounding Off Numbers	Round numbers of up to 5 digits correct to the nearest ten, hundred or thousand. Easier= round 2- or 3-digit numbers to the nearest ten, Medium= round 3- or 4-digit numbers to the nearest hundred, Harder= round 5-digit numbers to the nearest thousand.
	Adding Colossal Columns	Add numbers of up to 4 digits displayed in the vertical algorithm format. All answers of 4 digits or less. Easier= Add 3-digits to a 2-digit number with carrying from the ones; Medium= add 3-digit to 2-digit with carrying in both ones and tens columns; Harder= add a 4-digit number to a 3-digit with carrying in any column.

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New Zealand Number Level 3

AO	Activities Name	Description
NA3-4	**Know how many tenths, tens, hundreds, and thousands are in whole numbers.**	
	Nearest 1000?	Drag a number into the bucket that shows the nearest thousand.
	Nearest Thousand?	Drag balls into the buckets with the correct rounding.
	Subtracting Colossal Columns	Subtract numbers of up to 4 digits displayed in the vertical algorithm format. All answers of 4 digits or less. Easier= subtract 2-digit from 3-digit number. Borrowing from the tens column is always necessary, Medium= subtract 2-digit from 3-digit. Borrowing from tens and hundreds is always necessary, Harder= subtract 3-digit from 4-digit number. Borrowing from tens and hundreds is always necessary, but no borrowing from thousands required.
	Numbers from Words to Digits 2	Write numbers expressed in words as digits. Easier= 5-digit numbers; Medium= 6-digit numbers; Harder= 7-digit numbers.
	Decimals from Words to Digits 1	Write the decimal numbers for the given words - up to hundredths.
	Decimal Complements	Find the decimal complement that is added to the given number to make a sum of 1.
	Partition and Rename 2	Non-standard partitioning of a 4-digit number into two parts. Easier= partition into thousands and ones, Medium= partition into hundreds and ones, Harder= partition into tens and ones.
	Partition and Rename 3	Non-standard partitioning of a 5-digit number into two parts. Easier= partition into thousands and ones, Medium= partition into hundreds and ones, Harder= partition into tens and ones.
	Place Value Partitioning	Non-standard partitioning of a 3-digit number into three parts.
NA3-5	**Know fractions and percentages in everyday use.**	
	What Fraction is Shaded?	Write the fraction. Shaded circles are used. Easier = less than a whole, Medium and Harder questions involve writing the mixed numeral for the shaded circles.
	What Fraction Is Shaded 1	Write the fraction. Shaded circles are used. Easier = less than a whole, Medium and Harder questions involve writing the mixed numeral for the shaded circles.
	Decimal Order 1	< >= for Easier= tenths, Medium= hundredths, Harder = both.
	Calculating Percentages (Mental)	Calculate a percentage of a whole number (percentages are 10%, 20%, 25% and 50%). All calculations can be done mentally. Answers are positive whole numbers.
	Counting with Fractions on a Number Line	Easier = skip count along a number line to determine how many wholes and parts are in an improper fraction, Harder = compare a mixed and improper fraction using a number line.
	Equivalent Fractions on a Number Line 1	Match the given fraction with an equivalent point on a number line. Easier = unit fractions, Medium/Harder = fractions with numerators greater than one.

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New Zealand Number Level 3

AO	Activities Name	Description
NA3-5	**Know fractions and percentages in everyday use.**	
	Identifying Fractions Beyond 1	Identify the fraction that corresponds to the point on a number line. The number line is marked with 0, 1 and 2 only. All examples are improper fractions.
	Mixed and Improper Fractions on a Number Line	Identify the fraction that corresponds to the point on a number line. The number line is marked whole numbers only. Easier and Medium= improper fractions, Harder = mixed numbers.
	Compare Fractions 2	Compare three fractions of less than 1 by shading diagrams and then ordering them using <, =, >.
	Part-Whole Rods 2	Line up rods against one whole to identify the fractional relationships. This is an extension of part whole rods 1. In some questions students are required to find the whole from the parts.
	Uneven partitioned shapes 2	Identify the amount of space a tile takes up as a fraction of the whole square. Easier e.g. 1/3, Medium= e.g. 1/8, Harder = e.g. 1/12.
	Fraction Length Models 2	Calculate the length of a strip by comparing it to the given strip. Uses 1/2, 1/4 and 1/8. Easier & Medium= strip B is a fraction of strip A and strip C is a fraction of strip B, Harder = If strip B is 1/4 of strip A - how long is strip A? (unitise)
	Common Fractions as Percentages	Common fraction and percentage conversions.
	Mixed decimal, percentage and fraction conversions	Convert fractions, decimals and percentage; use simple conversions. The support shows the relevant conversions e.g. 3/4 - 75% - .75
	Subtract Like Fractions	Subtract fractions with common denominators.
	Common Denominator	Add or subtract two fractions with a common denominator. Proper and improper fractions used only. No mixed numbers in questions or answers. Answers may need to be simplified.
	One Take Fraction	Subtract a fraction from a whole number - fraction complements.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-1	Use a range of multiplicative strategies when operating on whole numbers.	
	Multiples	Determine which number from a group of four 1- and 2-digit numbers is not a multiple of a number from 2 to 10. Easier= multiples of 2, 5, 10, Medium= multiples of 3, 4, 6, Harder= multiples of 7, 8, 9.
	Multiples of	Determine which number from a group of four 1- and 2-digit numbers is not a multiple of a number from 2 to 10. Easier= multiples of 2, 5, 10, Medium= multiples of 3, 4, 6, Harder= multiples of 7, 8, 9.
	Estimation= Add and Subtract	Estimate the addition or subtraction of two whole numbers of up to 5 digits. Uses symbols +, – and ≈. Easier= round two 2- or 3-digit numbers to the nearest ten and then add or subtract to obtain estimate, Medium= round two 3- or 4-digit numbers to the nearest hundred and then add or subtract to obtain estimate, Harder= round two 5-digit numbers to the nearest thousand and then add or subtract to obtain answer.
	Contracted Multiplication	Multiplication of 2-, 3- and 4-digit numbers by a 1-digit number using vertical algorithm, including carrying.
	Multiply= 1-Digit Number	Multiplication of 2- and 3-digit numbers by a 1-digit number using vertical algorithm. No carrying.
	Long Multiplication	Multiplication of 2- and 3-digit numbers by a 2-digit number using vertical algorithm. Carrying included. Fill-in-the-gaps style so that not every number is needed.
	Long Multiplication Algorithm	Multiplication of 2- and 3-digit numbers by a 2-digit number using vertical algorithm. Carrying included. Fill-in-the-gaps style so that not every number is needed.
	Short Division	Division of 2-, 3-, 4- or 5-digit numbers by a 1-digit number using algorithm, including carrying and whole number remainders
	Estimation= Multiply and Divide	Estimate products and quotients of a 3- or 4-digit whole number by a 1-digit whole number.
	Estimate Products	Estimate the product of two 3-digit whole numbers.
	Prime or Composite?	Determine if a given number is prime or composite.
	Prime or Composite Numbers	Determine if a given number is prime or composite.
	Highest Common Factor	Find the 'HCF' Highest common factor of two or three numbers. 'Harder' questions generally involve 3-digit numbers and HCF of 11 or 13.
	Long Division	Long division (with fill the gaps working) for dividing 3-digit numbers by a 1-digit divisor and then by a 2-digit divisors up to 35 or 40. Includes remainders.
	Divide= 1-Digit Divisor 2	Long division (with fill the gaps working) for dividing 3-digit numbers by a 1-digit divisor only. No remainders and 0 remainder not displayed beside quotient.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-1	**Use a range of multiplicative strategies when operating on whole numbers.**	
	Long Division by whole numbers	Long division (with fill the gaps working) for dividing 3-digit numbers by a 1-digit divisor only. No remainders but with remainder shown as 0.
	Divisibility Tests	Consider two statements about divisibility and determine if correct or not.
	Divisibility - Tests	Consider two statements about divisibility and determine if correct or not.
	Lowest Common Multiple	Find the lowest common multiple of up to three numbers. Some questions would require use of prime factorisation to determine the answer.
	Least Common Multiple	Find the least common multiple of up to three numbers.
	Working Overtime	Calculate wages from information about overtime. Involves calculating several sums to find the total answer, Harder questions have decimals.
	Calculating Income Tax	Calculate income tax.
	Multiply= 2-Digit by 1-Digit	Multiply a 2-digit number by a 1-digit number using vertical algorithm, no carrying.
	Budgeting	Calculate how much money is left over from income vs expenses - addition and subtraction.
	Multiply= 1-Digit Number, Regroup	Multiply a 2-digit or 3-digit number by a 1-digit number using vertical algorithm, including carrying.
	Multiply= 2-Digit Number, Regroup	Vertical algorithm multiplication.
	Estimate Quotients	Estimate the results of division involving a number in the hundreds divided by a single digit - round to the nearest multiple.
	Divide= 1-Digit Divisor, Remainder	Long division to divide a 3-digit whole number by a 1-digit divisor with fill in the gaps working. Includes whole number remainders, denoted by R.
	Factors	Complete the list of factors of a whole number.
	Divide= 1-Digit Divisor 1	Long division of 2-digit numbers by 1-digit divisors with fill in the gaps working and no remainders.
	Divide= 2-Digit Divisor, Remainder	Long division of 3-digit numbers by 2-digit divisors with fill in the gaps working and whole number remainders denoted by R.
	Rounding Numbers for Division	Select compatible numbers for the division problem out of six possible choices.
	Bonuses and Leave Loading	Calculate leave loading, bonuses and gross amounts of pay.
	Tests of Divisibility 1	Determine if statements of divisibility are true/false for divisors of 2, 3, 4, 5, 6, 8, 9, 10

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-1	Use a range of multiplicative strategies when operating on whole numbers.	
	Mental Methods Division	Divide a 2- or 3-digit number by a number from 2, 3, 4, 6, 7, 10, 12, 16 number mentally. Strategies include using known multiplication facts; splitting the dividend into two parts that are both divisible by the divisor; halving both the dividend and divisor until you get an easier division. Answers are whole numbers with no remainders.
	Mental Methods Division 1	Divide a 2- or 3-digit number by 2, 4, 5, 8, 10, 12, 16 number mentally. Strategies include using known multiplication facts; splitting the dividend into two parts that are both divisible by the divisor; halving both the dividend and divisor until you get an easier division. Answers are whole numbers with no remainders.
	Mental Methods Division 2	Divide a 2- or 3-digit number by 3, 4, 5, 6, 8, 11, 12, 16 mentally. Strategies include using known multiplication facts; splitting the dividend into two parts that are both divisible by the divisor; halving both the dividend and divisor until you get an easier division. Answers are whole numbers with no remainders.
	Mental Methods Division 3	Divide a 2- or 3-digit number by 3, 4, 5, 7, 8, 9, 12, 16 mentally. Strategies include using known multiplication facts; splitting the dividend into two parts that are both divisible by the divisor; halving both the dividend and divisor until you get an Easier division. Answers are whole numbers with no remainders.
	Mental Methods Multiplication 2	Multiply 2-digit numbers by a 1-digit number or a multiple of ten; then multiply a 2-digit number up to 30 by either 9 or 11.
	Mental Methods Multiplication 3	Multiply 1-digit number by a 2-digit number, then a 2-digit number by 99, 101 etc., then decimal by 1-digit whole number or another decimal. Decimals of up to 2 decimal places.
	Grid Methods 1	Multiplication of 2- or 3-digit number by a 2, 3, 4, 5, 6 using the area model. Note= students must find the missing number in the area model.
	Grid Methods 2	Multiplication of 2-digit number by a 2-digit number using the area model.
	Grid Methods 3	Multiplication of 3-digit number by a 2-digit number using the area model.
	Divisibility Tests (2, 5, 10)	Determine if statements of divisibility are true/false for divisors of 2, 5, 10.
	Divisibility Tests (3, 4, 9)	Determine if statements of divisibility are true/false for divisors of 3, 4 and 9.
	Magic Symbols 2	Find the value of each of three symbols (using addition and subtraction) that fill either all or eight of the nine spaces in a 3 by 3 magic square. Easier= all row/column totals are 3-digit numbers. Only row/column totals are given, Medium= row/column totals are all decimals with the digit 5 in the tenths place and a maximum value of 30. Only row/column totals are given, Harder= all row/column totals are all decimals with digit 5 in the tenths place a maximum value of 30. The value in the central square is provided and only 4 of the 6 row/column totals are provided.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-1	**Use a range of multiplicative strategies when operating on whole numbers.**	
	Pyramid Puzzles 2	Fill in the missing numbers in a number pyramid.
	Word Problems with Letters	Calculate answers to two step problems using letters as variables.
	Multiply 2 Digits Area Model	Multiply a 2-digit number by another 2-digit number. No particular strategy suggested with question but support uses area model.
	Partition Puzzles 2	Use reasoning skills along with addition and subtraction facts to complete missing numbers in a diagram. In the harder questions more numbers are missing from the diagram and additions/subtractions get progressively harder.
	Identifying errors in the order of operations	Students are given fully worked solutions to problems involving the order of operations. They need to identify the line in which the error in solving the problem occurs. Easier = no brackets, Medium= brackets, Harder = brackets within brackets.
	Find the Factor	In each question, students find all the factor pairs for a number within the range of 1 - 100.
NA4-2	**Understand addition and subtraction of fractions, decimals, and integers.**	
	INTEGERS	
	Integers= Add and Subtract	Add and subtract integers (mixed operators).
	Add Integers	Add integers (operator always +).
	More with Integers	Adding and subtracting more than two integers.
	Adding Integers= Positive, Negative or Zero	Complete the number sentences containing negative numbers. A number line is shown.
	Subtract Integers	Subtract integers (operator always -).
	Integers= Subtraction	Subtraction with positive and negative integers.
	FINANCIAL MATHS	
	Reading from a Bill	Fill in the missing amounts on the bill. Calculate to a given number of decimal places. Involves operations with decimals.
	Money Problems= Four Operations	In each question, students use one of the four operations to solve problems with money. Addition problems can involve repartitioning cents to dollars; problems using the other operations do not. The monetary range is $1 - $25.
	Purchase Options	Identify the cheapest way to purchase various items.
	Comparing Loans	Calculate which loan scheme allows for the smallest repayment.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-2	**Understand addition and subtraction of fractions, decimals, and integers.**	
	FRACTIONS	
	Add= No Common Denominator	Add proper fractions with related denominators. All answers are proper fractions. Denominators are answers to multiplication facts up to 12 x 12. Easier= answer does not require simplification, Medium and Harder= answer requires simplification.
	Add Unlike Fractions	Includes simplification of the answer.
	Subtract= No Common Denominator	Subtract proper fractions with related denominators. All answers are proper fractions. Denominators are answers to multiplication facts up to 12 x 12. Easier= answer does not require simplification, Medium and Harder= answer requires simplification.
	Subtract Unlike Fractions	Includes simplification of the answer.
	No Common Denominator	Addition and subtraction of fractions with no common denominator. Easier = unit fractions, Medium= includes fractions with numerators greater than one, Harder = may include 2-digit numbers e.g. 3/21 + 1/7.
	Mixed Numerals	Addition and subtraction of mixed numerals; Easier = common denominator, Medium= related denominators, Harder = unrelated denominators.
	Add Like Mixed Numbers	Add mixed numbers with common denominators.
	Subtract Like Mixed Numbers	Subtract mixed numbers with common denominators.
	Add Mixed Numbers= Same Sign	Add two mixed numbers. Includes use of negative mixed numbers. Either both mixed numbers are positive, or both are negative with a plus sign between. Denominators may be unrelated. Some fractions need to be simplified by a common factor.
	Subtract Mixed Numbers= Renaming	Separate the whole number from the fraction. Rename the fractions to become like fractions.
	DECIMALS	
	Adding Decimals	Add two decimals of up to 3 decimal places each. Decimals in any one question may have a different number of decimal places.
	Add Decimals 2	Add two decimals of up to 3 decimal places. Addends always have a different number of decimal places.
	Subtracting Decimals	Subtract decimals up to 3 decimal places. Addends always have value less than 1 but can have a different number of decimal places. Result always positive.
	Subtract Decimals 2	Subtract decimals of up to 2 decimal places. Addends can have value up to 10 with up to 3 decimal places. Addends in any one question may not have the same number of decimal places. Result always positive.

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Mathletics

New Zealand Number Level 4

AO	Activities Name	Description
NA4-2	**Understand addition and subtraction of fractions, decimals, and integers.**	
	DECIMALS	
	Add Decimals 1	Add two decimals of up to 3 decimal places. Addends can have a different number of decimal places.
	Subtract Decimals 1	Subtract decimals of up to 2 decimal places. Addends can have value up to 10 with up to 3 decimal places. Addends in any one question may not have the same number of decimal places. Result always positive.
	Estimate Decimal Differences 1	Round each value to the nearest whole number to estimate the difference between two decimal values. Addends range in value between 1 and 100 and have up to 3 decimal places.
	Estimate Decimal Sums 1	Round each value to the nearest whole number to estimate the sum of two decimal values. Addends range in value between 1 and 100 and have up to 3 decimal places.
	Estimate Decimal Differences 2	Round each value to the nearest whole number to estimate the difference.
	Estimate Decimal Sums 2	Round each value to the nearest whole number to estimate the sum. Decimals up to 3 places.
NA4-3	**Find fractions, decimals, and percentages of amounts expressed as whole numbers, simple fractions, and decimals.**	
	Percent of a Number (Mental)	Calculate a percentage of a number. Percentages are 10%, 20%, 25% and 50%. No calculator required. Answers can be decimals.
	Percentage of a Quantity	Find a given percentage of an amount of money. Includes percentages over 100%. Answers required as decimals to 2 decimal places.
	Percentage Change= Increase and Decrease	Increase or decrease an amount of money by a given percentage. Percentages less than 100%. Answers expressed as decimals correct to decimal places.
	Fraction Word Problems	Includes expressing one quantity as a fraction of another (with simplification) and finding the whole amount given the value corresponding to a given fraction of the whole.
	Percentage Composition	Read values in a table. Calculate percentages of numbers in the hundreds e.g. 395 out of 500.
	Percentage Word Problems	Three types of questions= percentage of a number, unitary method, express one quantity as percentage of another
	Ratios	Calculate ratios.
	Solve Percent Equations	Includes the unitary method.
	Percent Increase and Decrease	Find the percentage by which an amount has increased/decreased. Whole number percentages only.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-3	**Find fractions, decimals, and percentages of amounts expressed as whole numbers, simple fractions, and decimals.**	
	Net Pay	Calculate the net weekly income for a variety of situations.
	Quantities to a percentage (no units)	All examples are easily converted into a fraction with a denominator of 100 in order to find the percentage.
	Quantities to a percentage (units)	Express a quantity as a percentage of another quantity, Harder = the quantities may be in different units.
	Fraction by Whole Number	Multiply a whole number by a proper fraction. The denominator is provided for all answers. Answers are all improper fractions.
NA4-4	**Apply simple linear proportions, including ordering fractions.**	
	Selecting Equivalent Fractions	Choose the fraction with the same shaded area.
	Equivalent Fractions	Calculate equivalent fractions. Harder questions involve large numbers.
	The Equivalent Fraction	Calculate equivalent fractions.
	Simplify Fractions	Simply fractions using multiplication and division facts.
	Equivalent Ratios	Simplify one ratio to find the terms in the equivalent ratio. Harder = 3 numbers and involves measurement unit conversions.
	Solve Proportions	Solve equations involving two equivalent fractions with one unknown. Unknown can be in numerator or denominator.
	Comparing Fractions 2	Use < > = convert fractions to common denominators first in order to compare.
	Shading Equivalent Fractions	Use common factors to find an equivalent fraction.
	Simplifying Fractions	Use the highest common factor to simplify fractions.
NA4-5	**Know the equivalent decimal and percentage forms for everyday fractions.**	
	Fractions to Decimals	Convert fractions with denominators other then 10, 100, 1000 into decimals. All answers are terminating decimals.
	Fractions to Decimals 2	Convert fractions to decimals. Values over 1 included.
	Modelling Percentages	Calculate the percentage of the hundreds square that is shaded, not shaded, percentage shaded and equivalent fractions.
	Fraction to Percentage (Non-Calculator)	Convert fractions including multiples of 100 to percentages. The support teaches converting the fraction to 100 first. Examples are easily multiplied or divided to create a denominator of 100.
	Fraction to Percentage (Calculator)	Convert a fraction to a percentage. Easier = denominator under 100, Medium= denominator over 100, H = mixture.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-5	**Know the equivalent decimal and percentage forms for everyday fractions.**	
	Common Fractions as Percentages (AU)	Convert common fractions to percentages. Easier= simple percentages such as 20%, Harder = less common ones such as 37.5 percent as a fraction. The support provides the conversions.
	Percentages greater than 100% to Mixed Numerals	Convert percentages to mixed numerals. Students choose the format of the answer that is appropriate - e.g. whole number or mixed numeral.
	Decimals to Fractions 1	Convert decimals of up to 3 decimal places to fractions with denominators 10, 100, 1000. Some involve values greater than 1 that must be written as an improper fractions. Fractional result is not simplified.
	Convert Decimals to Fractions 2	Convert decimals (always hundredths) to fractions and simplify if possible.
	Percentage to Fraction	Convert percentages (less than or equal to 100%) into fractions. Simplification of fraction always required.
	Match Decimals and Percentages	Includes fractions, decimals and percentages. Must know fraction to decimal conversions.
	percentage to fraction (with and without simplification)	Write percentages as fractions. For example, 64% as a fraction 64/100 Easier= no simplification, Medium= simplification, Harder= a mixture.
	Mixed numerals to percentages greater than 100%	Convert mixed numerals to percentages. The support teaches students to multiply the whole number by 100 and the fraction (divided) by 100.
	Decimal to Percentage	Convert decimals to percentages and vice versa.
NA4-6	**Know the relative size and place value structure of positive and negative integers and decimals to three places.**	
	Decimals on the Number Line	Place decimals on a number line. All decimals are in hundredths. The number line is between 0-1 or 1-2.
	Divide Decimals= 10, 100, 1000	Divide decimals with value between 0 and 1000 and up to 3 decimal places by powers up 10. Powers of ten up to value 1000. No whole numbers divided by a power of ten.
	Comparing Decimals	Compare two, three or four decimals of up to 3 decimal places with a value of less than 1 to determine the decimal with the largest value.
	Comparing Integers (<, =, >)	Compare the relative size of two integers using <, =, >
	Decimal Order	Compare the relative size of two decimals using <, =, > Easier = all tenths, Medium = hundredths and tenths, Harder = tenths, hundredths, thousandths.
	Negative or Positive?	Adding and subtracting integers with jumps on a number line.
	Comparing Integers	Compare the relative size of two integers using <, =, >
	Directed Numbers	Recognising integers on a number line.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-6	**Know the relative size and place value structure of positive and negative integers and decimals to three places.**	
	Decimals on a Number Line	Locate decimals on a number line. Easier = tenths, Medium= hundredths, Harder = thousandths.
	Multiply Decimals= 10, 100, 1000	Multiply decimals by 10, 100 or 1000. Easier = tenths x 10, Medium = tenths or hundredths by 10 or 100, Harder = thousandths by 1000.
	Multiply Decimals 10 100 1000	Multiply decimals of up to 4 decimal places by 10, 100 or 1000. Answers can be whole numbers or have one decimal place. No whole numbers multiplied by a power of ten
	Divide by Powers of 10	Divide decimals with value between 0 and 1000 and up to 3 decimal places by powers up 10. Powers of ten up to value 10 000. No whole numbers divided by a power of ten.
	Divide Decimals by Powers of 10 100 1000	Divide decimals with value between 0 and 1000 and up to 3 decimal places by powers up 10. Powers of ten up to value 1000.
	Integers on a Number Line	Recognising integers on a number line.
	Rounding Decimals 1	Round decimals with up to 2 decimal places, including decimals with a value greater than 1 to the nearest whole number or nearest tenth only.
	Ordering Fractions 1	Given a set of three proper fractions with different denominators, order them from 'least to greatest' using drag and drop.
	Absolute Value	Find the absolute value of the given number.
	Comparing Decimals 2	Compare two, three or four decimals of up to 3 decimal places with value less than 1 to determine the decimal with the largest value.
	Decimal Order 2	Compare two decimals. Harder = includes decimals up to 4 places.
	Comparing Fractions with Signs	Compare two positive or negative fractions then select whether they are greater than, less than or equal to each other.
	Place Value to Billions	Identify the digit that has a particular place value in a number of up to 10 digits.
	Decimals from Words to Digits 2	A decimal is given in words, students must write the digits (up to 3 decimal places).
	Comparing Numbers	Place one of the symbols <, =, > between two 10-digit numbers.
	Decimal Place Value	State the digit with the given place value (tenths or hundredths) in decimals of up to 2 decimal places.
	Equivalent Fractions on a Number Line 2	This is an extension of 'Equivalent Fractions on a Number Line 1', harder examples include fractions with 2 digits, for example 30/100.

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New Zealand Number Level 4

AO	Activities Name	Description
NA4-6	**Know the relative size and place value structure of positive and negative integers and decimals to three places.**	
	Fraction Wall Labelling 1	Use a part-whole model and a range of additive and multiplicative strategies to compare equivalent fractions in a 'brick wall' style model. Then find fractions of numbers, recording answers as decimals. Easier = the whole 'brick' at the top of the model is an even number, Medium = the whole is an odd number, Harder = the whole is a decimal.
	Fraction Wall Labelling 2	Use a part-whole model and a range of additive and multiplicative strategies to compare equivalent fractions in a 'brick wall' style model. Then find fractions of numbers, recording answers as decimals. The whole 'brick' at the top of the model is unknown in the harder questions and must be calculated using the other fractions in the model.
	Place Value 1 (×10 and ÷10)	Use the place value chart to form the given number. Shift the numbers to the write or left to multiply or divide by 10.
	Place Value 2 (×10 and ÷10)	Use the place value chart to form the given number. Shift the numbers to the write or left to multiply or divide by 10. This activity uses larger numbers than Place Value 1. Up to millions.
	Numbers from Words to Digits 3	Write numbers expressed in words as digits. Easier= 6-digit numbers; Medium= between 7- and 9-digit numbers; Harder= between 10- and 12-digit numbers.
	Ordering Integers (number line)	Drag integers onto a number line.

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New Zealand Number Level 5

AO	Activities Name	Description
NA5-1	**Reason with linear proportions**	
NA5-2	**Use prime numbers, common factors and multiples, and powers (including square roots).**	
	Estimating Square Roots	Estimate square roots of whole numbers up to 144.
	Estimate Square Roots	Estimate square roots of whole numbers up to 144.
	Index Notation	Write a product of positive integers in exponential form. More than one 'base' per question.
	Exponents	Write a product of positive integers in exponential form. One only 'base' per question.
	Index Notation and Algebra	Write the product of a number of variables in index notation. May be more than two variables.
	Product of Prime Factors	Factorise numbers of up to five-digits using prime factors. No use of index notation.
	Prime Factoring	Factorise numbers of up to five-digits using prime factors. No use of index notation.
	The Zero Index	Calculate the value of an expression with positive integer bases and positive integer indices. Knowledge of order of operations is required.
	Square Roots 1	Find square roots of whole numbers using multiplication facts up to 12 x 12, including square numbers multiplied by 100.
	Prime Factoring with Indices	Prime factoring with indices for answers.
	Square Roots	Find squares and square roots of whole numbers using multiplication facts up to 12 x 12.
	Square and Cube Roots	Use product of prime factors to find square and cube roots of large numbers.
	Powers of Integers	Evaluate an integer base raised to a positive integer index. Bases -10, -2, -1, 2, 10 can have powers of 2, 3, 4, or 5. Bases -5, -4, -3, 3, 4, or 5 can have powers of 2 or 3.
NA5-3	**Understand operations on fractions, decimals, percentages, and integers.**	
	FINANCIAL MATHS	
	Profit and Loss	Students first need to calculate whether the question is asking for profit or loss. Express the profit or loss as a percentage.
	Wages and Salaries	Work out the best pay using given hourly, weekly, yearly and fortnightly pay options.
	Commission	Calculate commission using percentages - large numbers involved.

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New Zealand Number Level 5

AO	Activities Name	Description
NA5-3	Understand operations on fractions, decimals, percentages, and integers.	
	FINANCIAL MATHS	
	Piecework and Royalties	Calculate the total pay once bonuses and percentages are applied. Requires knowing how to find areas of rectangles also.
	Calculating Dividends	Calculate the total dividend return and then calculate the dividend yield.
	Credit Card Repayments	Calculate the interest charged on credit card statements.
	Best Buy	Identify the cost for all options to calculate the best buy. For example, compare cost per weight/packages.
	Simple Interest	Use the simple interest formula of SI = PRT (P = amount invested in dollars, R = rate of interest per year, T = time in years).
	Comparing Home Loans	Use a table of repayment amounts to calculate the total repayments of a given loan interest rate. Multiply the decimal amount by the given number of years.
	GST	Calculate GST.
	Deductions and Tax Instalments	Calculate tax owing once deductions have been taken off.
	DECIMALS AND PERCENTAGES	
	Calculating Percentages 1	Calculate a percentage of a number. Percentages include any whole percentage less than 100% and percentages involving 1/2 of one percent. No percentages over 100%.
	Decimal by Whole Number	Multiply a decimal value between 0 and 1 of up to 3 decimal places by a whole number.
	Multiply Decimal by Whole Number	Calculate multiplication of a decimal by a whole number by turning the decimals into whole numbers. Decimals always multiplied by a single digit.
	Decimal by Decimal	Multiply a decimal value between 1 and # by a decimal of value between 0 and 1. Easier= multiply decimal of the form #.# by decimal of the form 0.# ; Medium= multiply decimal of the form #.## by decimal of the form 0.# ; Harder= multiply decimal of the form #.## by decimal of the form 0.##.
	Multiply Decimal by Decimal	Multiply a decimal value between 1 and # by a decimal of value between 0 and 1. Easier= multiply decimal of the form #.# by decimal of the form 0.# ; Medium= multiply decimal of the form #.## by decimal of the form 0.# ; Harder= multiply decimal of the form #.## by decimal of the form 0.##.
	Divide Decimal by Whole Number	Divide whole number into decimal to 2 places.
	Divide Decimal by Decimal	Divide a decimal by a decimal.

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Mathletics

New Zealand Number Level 5

AO	Activities Name	Description
NA5-3	**Understand operations on fractions, decimals, percentages, and integers.**	
	DECIMALS AND PERCENTAGES	
	Multiply Decimals= Area Model	Partition each decimal. Multiply each part and then add.
	Multiply Decimals 1	Multiply two decimals between 0 and 1 with one decimal place using an interactive 10 x 10 grid as a visual guide.
	Divide Decimals	Easier = always in the tenths with a zero in the ones place, Medium = always in the tenths with a digit or a zero in the ones place, Harder = divide a number in the tenths by a number in the hundredths.
	Percentage of an amount using fractions (<100%)	Find the percentage of an amount using fractions. The support teaches turning the percentage into a fraction, simplifying then multiplying to find the percentage. E.g. 95 % of 300 as 95/100 x 300/1.
	FRACTIONS	
	Add Unlike Mixed Numbers	Add whole numbers and fractions separately to calculate the sum.
	Multiplying Fractions	Multiply two or three proper fractions. Easier = two fractions, no simplification required, Medium = two fractions, answer needs to be simplified; Harder = three fractions, answer needs to be simplified.
	Multiply Two Fractions 1	Multiply two proper fractions. Questions may or may not need to be simplified.
	Dividing Fractions	Divide two or three proper fractions. Easier = two fractions, no simplification required, Medium = two fractions, answer needs to be simplified; Harder = three fractions, answer needs to be simplified.
	Divide Fractions by Fractions 2	Divide two proper fractions. One or both fractions have a negative numerator. Answers are mixed numerals and may need to be simplified.
	Multiply Two Fractions 2	Multiply two proper fractions to obtain a proper fraction. One or both fractions have a negative numerator. Answers may need to be simplified.
	Divide Fractions by Fractions 1	Divide two or three proper fractions. Easier = two fractions, no simplification required, Medium = two fractions, answer needs to be simplified; Harder = three fractions, answer needs to be simplified.
	Subtract Mixed Numbers= Signs Differ	Subtract two mixed numbers. Mixed numbers can be positive or negative but operation is always subtraction. Denominators may be unrelated.
	Subtract Unlike Mixed Numbers	Separate the whole number from the fraction. Rename the fractions to become like fractions. Simplify where needed.
	Multiply Mixed Numbers	Multiply two mixed numerals to obtain a mixed numeral. Simplification may be required.
	Divide Mixed Numbers	Divide a mixed number by a mixed number. Answers are mixed numbers that may need to be simplified.

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New Zealand Number Level 5

AO	Activities Name	Description
NA5-3	**Understand operations on fractions, decimals, percentages, and integers.**	
	FRACTIONS	
	Add Mixed Numbers= Signs Differ	Add or subtract two mixed numbers. All mixed numbers are positive with either a plus or minus sign between. Denominators may be unrelated. All answers are positive.
	Divide Whole Number by Fraction	Divide a whole number by a proper fraction. Answers may need to be simplified. .
	Multiply= Whole Number and Fraction	Multiply a whole number by a proper fraction. Answers are all mixed numerals.
	Divide Mixed Numbers with Signs	Divide mixed numerals. Mixed numerals may be negative.
	Using Reciprocals	Write the reciprocal of a fraction, whole number or mixed numeral. Easier= reciprocal of a proper fraction, Medium= reciprocal of a whole number, Harder= reciprocal of a mixed number.
	Divide Fractions Visual Model	Use an interactive to assist in dividing unit fractions by whole numbers.
	Estimate Products with Fractions	Estimate the multiplication of a number by a mixed fraction. First round the whole number in the mixed fraction to a number closest to a multiple of the denominator in the fraction. Multiply the whole number and the fraction.
	Operations with Fractions	Divide one proper/improper fraction by another proper/improper fraction. No mixed numerals. Fractions may be negative.
	Model Fractions to Multiply	Shade in shapes split into given fractions - multiply a whole number by the unit fraction.
	Divide by a Unit Fraction	Divide a whole number by a unit fraction. Answers are whole numbers.
	Subtract Negative Mixed Numbers	Subtract two negative mixed numbers. Mixed numbers are all negative but operation is always subtraction. Denominators may be unrelated.
	Multiply Fraction by Fraction	Multiply two proper fractions using a visual model.
	INTEGERS	
	Integers= Multiply and Divide	Multiplying and dividing integers using multiplication facts.
	Integers= Multiplication and Division	Multiplying and dividing integers using multiplication facts.
	Integers= Order of Operations (BIDMAS)	Order of operations with integers but no grouping symbols, fraction bars or indices.
	Integers= Operations Order	Order of operations with integers including indices but with no grouping symbols or fractions bars.
	Multiplying and Dividing Integers	Determine whether the answer to the multiplication/division of integers will be negative or positive or zero. Easier = two integers and one operator, Medium = three integers and two operators, Harder = six integers (2 digits) and five operators.

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New Zealand Number Level 5

AO	Activities Name	Description
NA5-4	**Use rates and ratios.**	
	Time Taken	Calculate the time taken to travel a particular distance given the speed a car is travelling at in km/hr. Easier = numbers that are multiples of 10 or 100, Medium = the speed is always a multiple of 10, the distance is any number in the hundreds, Harder = may include decimals to one place.
	Average Speed	Calculate the speed based on a given distance and time. Easier = the distance is a number in the hundreds and the time is a single digit - they are related facts, Medium = the time is in hours and minutes and the distance is a number in the hundreds, Harder = the distance is a number in the thousands.
	Distance Travelled	Calculate the distance travelled using a given speed and time. Easier = the speed is a multiple of 10 and the time is a single digit number in hours, Medium = the speed is a 2-digit multiple of five and the time is in hours and minutes (with the minutes a multiple of 10), Harder = the speed is a 2-digit multiple of five and the time is in hours and minutes.
	Ratio	Simplification of ratios, expressing relationship between two or three numbers or measurements. Different units may be used for different terms in the ratios. Metric units used.
	Dividing a Quantity in a Ratio	Easier = divide a 2 digit number into a given ratio, Medium = divide a 2 or 3 digit number into a given ratio, Harder = divide a 2 digit number into a 3 part ratio.
	Rates Word Problems	Easier = requires multiplication of a single digit number with a 2-digit number according to the given rate, Medium = multiplication and division using rates with numbers up to the hundreds, Harder = requires more interpretation of the questions.
	Ratio Word Problems	Covers both types - find the other part of ratio given one part, and division of a quantity in given ratio.
	Word problems= ratio	Given one side of ratio, find the other.
	Rates Calculations	2- or 3-step word problems involving applications of rates to measurement problems, including conversions of units of length/mass.
	Unitary Method	Word problems in which a simplified rate is found to solve the problem.
	Ratio and Proportion	Find the percentage of the total of one part of a two-term ratio, or of one or two parts of a three-term ratio.
	Simplify Ratios= 2 whole numbers	Simplify ratios in the form a=b. Support shows Highest Common Factor method.
	Simplify Ratios= 3 Whole Numbers	Simplify ratios in the form a=b=c. Support shows Highest Common Factor method.
	Simplify Ratios=Fractions	Convert unlike fractions to like fractions to find the ratio - simplify where necessary.

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New Zealand Number Level 5

AO	Activities Name	Description
NA5-4	**Use rates and ratios.**	
	Simplify Ratios= Mixed Numbers	Simplify a ratio of the form a=b where at least one of the numbers are mixed numbers. Convert the mixed number to an improper fraction first.
	Simplifying Ratios with Decimals	Simplify ratios with decimals presented in the form a=b. Easier = one whole number with one decimal, Harder = both numbers are decimals of up to two decimal places.
NA5-5	**Know commonly used fraction, decimal, and percentage conversions.**	
	Decimals to Fractions 2	Convert decimals of up to 3 decimal places to fractions and give the answer as a simplified fraction. No decimal has a value over 1, i.e. no mixed numeral answers, only proper fractions.
	Percents to Fractions	Convert percentages (less than or equal to 100%) into fractions. Simplification of fraction always required.
	Fraction to Terminating Decimal	Convert fractions with denominators other than 10, 100, 1000 into decimals. All answers are terminating decimals.
NA5-6	**Know and apply standard form, significant figures, rounding, and decimal place value.**	
	Significant Figures	Find the number of significant figures in a given number. Easier = numbers in hundreds, Medium = tens of thousands, Harder = decimals of up to 7 places.
	Rounding Decimals	Round decimals with up to 6 decimal places, including decimals with a value greater than 1 to the nearest whole number or up to 3 decimal places.
	Rounding Significant Figures	Round the numbers according to the number of significant figures. Easier and Medium questions require rounding to 3 significant figures, Harder = rounding to significant figures.
	Scientific Notation	Convert to scientific notation.
	Scientific Notation 1	Write 3- and 4-digit whole numbers in scientific notation by working out the coefficient and the power of 10.
	Scientific Notation 2	Write a mixture of 3- to 5 -digit whole numbers and decimals with value less than 1 in scientific notation by working out the coefficient and the power of ten.
	Rounding Decimals 2	Round decimals with up to 6 decimal places, including decimals with a value greater than 1 to the nearest whole number or up to 3 decimal places.
	Estimate Decimal Operations	Round each value to the nearest whole number to estimate the product or quotient of two decimal places.
	Scientific Notation to Decimal	Easier = decimals up to 7 places multiplied by positive exponents of 10, Medium = as for Easier but using negative exponents, Harder = mixture.
	Ordering Scientific Notation	Easier= expand the decimals by multiplying by positive exponents of 10 and then order, Medium= negative exponents, Harder = a mixture of positive and negative exponents.

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Mathletics

New Zealand Algebra Level 1

AO	Activities Name	Description
NA1-5	**Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many.**	
	Ordinal Numbers	Identify the 'first', 'second', ... 'tenth' item in the line of objects.
	How Many?	Count the number of objects and write the numeral. Numerals from 1 to 9 only.
	Matching Numbers to 10	Given a number of beads up to 10, select the number and the number word for the number of beads. Numbers from 1 to 10.
NA1-6	**Create and continue sequential patterns.**	
	Simple Patterns	Shape/colour patterning. Select the next item to be placed at the end of the given pattern. No numbers.
	Pattern Error	Examine a given shape/colour pattern and select the item that does not fit the pattern. No numbers.
	Missing it!	Shape/colour patterning. Select the missing item to fit in the gap in the pattern. No numbers.
	Colour Patterns	Colour patterning on a snake. Select the colour to fit in the gap in the pattern. No numbers. Up to eight colours in pattern. Each colour appears once in the repeating sequence.
	Complete the Pattern	Complete the pattern involving shapes.

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Mathletics

New Zealand Algebra Level 2

AO	Activities Name	Description
NA2-6	**Communicate and interpret simple additive strategies, using words, diagrams (pictures), and symbols.**	
	Problems= Addition and Subtraction	Given a simple word problem involving addition or subtraction with whole numbers between 1 and 10, select the 'mathematical equation' that represents the solution to the problem and then calculate the solution. Answers range from 1 to 20. Uses symbols +, –, = and $. Need to know that there are 7 days in a week.
	Problems= Add and Subtract	Given a simple word problem involving addition or subtraction with whole numbers between 1 and 10, select the 'number sentence' that represents the solution to the problem and then calculate the solution. Answers range from 1 to 20. Uses symbols +, –, = and $. Need to know that there are 7 days in a week.
	Word Problems= Add and Subtract	Given a simple word problem involving addition or subtraction with whole numbers between 1 and 10, select the 'mathematical equation' that represents the solution to the problem and then calculate the solution. Answers range from 1 to 20. Uses symbols +, –, = and $. Need to know that there are 7 days in a week.
	Balance Numbers to 10	Select a number to add the given number on one of a balance scale and then select another number to represent to the sum on the other side of the scale. Sums can total up to 10.
	Balance Numbers to 20	Select a number to add the given number on one of a balance scale and then select another number to represent to the sum on the other side of the scale. Sums can total up to 20.
	Composing Additions to 20	Select two whole numbers that add to make the same sum as the two whole numbers on the other side of the scale. Sums can total up to 20.
	Multiplication Turnarounds	Write two multiplication facts to describe the given model. Facts up to 10 × 10. This is the commutative property of multiplication.
NA2-7	**Generalise that whole numbers can be partitioned in many ways.**	
	Odd and Even Numbers 1	Click on the number that is not even or not odd. (includes numbers in the hundreds).
	Make Big Numbers Count	Model a given two-digit number using place value blocks of tens and ones.
	Make Numbers Count	Determine the value of the number represented by place value blocks of tens and ones. Number in the teens only.

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New Zealand Algebra Level 2

AO	Activities Name	Description
NA2-8	**Find rules for the next member in a sequential pattern.**	
	Increasing Patterns	Determine the next number in an increasing sequence of whole numbers of up to 2 digits. Patterns may increase by one, two, three, four, five, seven, eight, nine.
	Count Forward Patterns	Counting forwards from any starting point by ones, twos, threes, fours, fives or tens.
	Count Backward Patterns	Calculate the next number by first identifying the pattern. Includes numbers in the hundreds. Counts in 1s, 2s, 3s, 4s 5s and 10s.
	Count by Twos	Fill in the missing numbers. Counting up by two each time but not necessarily in multiples of 2.
	Count by Fives	Fill in the missing numbers. Counting up by five each time but not necessarily in multiples of 5.
	Counting on a 100 grid	Use a hundreds chart (10 × 10 grid) to assist in finding two missing numbers in a pattern of whole numbers. Patterns can increase/decrease by 2, 3, 5, 10.
	Counting up in 4s	Counting forward. Easier = write the next number, Medium= write 2 more numbers, Harder = write 3 more numbers.

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Mathletics

New Zealand Algebra Level 3

AO	Activities Name	Description
NA3-6	**Record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality.**	
	Missing Values	Solve equation without variables
	Missing Numbers	Find the missing number (represented by a triangle). Easier = simple addition and subtraction problems with one number missing, Medium/ Harder = increasingly harder addition and subtraction problems. E.g. 24 + ? = 51
	Mass Word Problems	Mixed operation problems using mass. Involves addition or subtraction of 2-digit numbers and multiplication of numbers in multiples of 10 or 100 by a single digit. Select the correct equation first.
	Order of Operations 1 (BIDMAS)	Apply the order of operations to evaluate expressions involving whole numbers, the four operations and grouping symbols. No indices, no square/cube roots, no fraction bars.
	Find the Missing Number 1	Find the unknown number in an expression in which there are two whole numbers added/subtracted/multiplied/divided on one side of the equation and only one whole number on the other side. Unknown always positioned after the operator.
	Find the Missing Number 2	Find the unknown number in an expression in which there are two whole numbers added/subtracted/multiplied/divided on one side of the equation and two whole numbers add/subtracted/multiplied/divided on the other side. Unknown always positioned after the operator.
	Bar Model x divide	Solve division problems using the bar model (bar already partitioned into the correct parts), Harder questions require students to partition the bar correctly themselves to solve the problem.
NA3-7	**Generalise the properties of addition and subtraction with whole numbers.**	
	Addition Properties	Commutative and associative properties of addition with three 1-digit numbers.
	Commutative Property of Addition	Enter the missing number in each of the two related number sentences. In one number sentence the second addend is missing. In the other number sentence, the first addend is missing. The number entered is the same in both number sentences.

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Mathletics

New Zealand Algebra Level 3

AO	Activities Name	Description
NA3-8	**Connect members of sequential patterns with their ordinal position and use tables, graphs, and diagrams to find relationships between successive elements of number and spatial patterns.**	
	Patterns - Increasing	Determine the next number in an increasing sequence of whole numbers of up to 2 digits. Patterns may increase by one, two, three, five, seven, eight, nine.
	Decreasing Patterns	Determine the next number in a decreasing sequence of whole numbers of up to 2 digits. All answers are positive whole numbers. Patterns may decrease by two, three, four, six, seven, eight, nine.
	Patterns - Decreasing	Determine the next number in a decreasing sequence of whole numbers of up to 2 digits. All answers are positive whole numbers. Patterns may decrease by one, three, five, seven, eight, nine.
	Table of Values	Calculate the rule linking the 'first number' to the 'second number' and use this to determine the second number for a much larger first number. Rules are not written down and consist of one operation only (either add or multiply). Positive whole numbers only.
	Fit the Conditions 1	Highlight the numbers that fit the condition given e.g. odd/even, multiples.
	Counting up in 6s	Easier = write the next number (up in 6s), Medium= write the next 2 numbers, Harder = write the next 3 numbers.
	Counting up in 7s	Easier = write the next number (up in 7s), Medium= write the next 2 numbers, Harder = write the next 3 numbers.
	Counting up in 8s	Easier = write the next number (up in 8s), Medium= write the next 2 numbers, Harder = write the next 3 numbers.
	Pick the Next Number	Determine the next number in a sequence of whole numbers of up to 3 digits that either increases or decreases. Sequences are arithmetic (ie have a common difference). Common difference is always a whole number of up to 2 digits.
	Describing Patterns	Describe patterns of positive whole numbers of up to 3 digits as either 'increasing' or 'decreasing' and calculate by how much they increase or decrease. Sequences increase/decrease by a whole number of up to 2 digits. All sequences are arithmetic (have a common difference).

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Mathletics

New Zealand Algebra Level 4

AO	Activities Name	Description
NA4-7	**Form and solve simple linear equations**	
	Complex Substitution	Substitute positive and negative whole numbers into expressions. Indices up to 2. No fractions. No surds.
	Missing Values= Decimals	Find the unknown decimal/whole number in an expression in which there are two decimals/whole numbers added/subtracted/multiplied/divided on one side of the = and only one decimal/whole number on the other side. Unknown always positioned after the operator.
	Simple Substitution	No indices, expressions only (not formulae), substitute positive numbers only.
	Simplifying Expressions	Mixed operations with algebra. Indices up to 3 for division. Order of operations required.
	Simple Substitution 1	Substitute positive numbers into simple expressions. No indices.
	Like Terms= Add and Subtract	Add and subtract up to six algebraic terms. All terms involve only one variable. Indices of up to 2. Knowledge of the addition and subtraction of integers required.
	Like Terms= Add, Subtract	Add and subtract up to four terms. All terms involve only one variable. No indices. Knowledge of the addition and subtraction of integers required.
	Algebraic Multiplication	Simplify algebraic expressions involving multiplication.
	Solving Simple Equations	Solve one and two-step equations.
	Solve Two-Step Equations	Easier = solve equations in the form $x + 3 = -6$, Medium = solve equations in the form $5x + 36 =$, Harder = solve equations in the same form as for Medium but with larger numbers.
	Equations with Grouping Symbols	Solve equations with pronumerals on both sides and grouping symbols.
	Solve Multi-Step Equations	Solve equations with pronumerals on both sides and grouping symbols.
	Equations to Solve Problems	Solve equations with pronumerals on both sides.
	Find the Mistake	Solve equations with pronumerals on both sides
	Writing Algebraic Expressions	Simple operations expressed in an algebra, such as 'a number decreased by 3.'
	Simple Substitution 3	Substitute positive numbers into simple expressions. No indices. Mixed operations and 2 variables.
	Simple Substitution 2	Substitute positive numbers only into expressions. No indices.
	Solve Equations= Add, Subtract 1	Solve equations involving one step of addition or subtraction. Decimal values may occur with question from question 1. Answers may be positive or negative whole numbers or decimals. Unknown always on left side of equation and in the left-most position.

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Mathletics

New Zealand Algebra Level 4

AO	Activities Name	Description
NA4-7	**Form and solve simple linear equations**	
	Solve Equations= Add, Subtract 2	Solve equations involving one step of addition or subtraction. All equations presented as the addition/subtraction of a negative number, e.g. x-(-3) =8. Decimal values may occur with question from question 1. Answers may be positive or negative whole numbers or decimals. Unknown always on left side of equation.
	Solve Equations= Multiply, Divide 1	Solve equations involving one step of multiplication or division. All equations presented as $ax=c$ or as a fraction $x/a=c$. All numbers are positive whole numbers. No negative values. No decimal values.
	Solve Equations= Multiply, Divide 2	Solve equations involving one step of multiplication or division. All equations presented as $ax=c$ or as a fraction $x/a=c$. Numbers may be positive or negative whole numbers. No decimal values. Answers may be negative. Unknown always on left side of equation and in the left-most position.
	Grouping in Pairs	Factorise the polynomials.
	Write an Equation= Word Problems	Calculate the equation that relates to the word equation and then solve for the unknown. Involves one operation only.
	Missing Numbers= Variables	Solve equations involving one step of addition or subtraction. Answers always positive whole numbers. Unknown always on left side of equation, but not the left-most term.
	Substitution in Formulae	Calculate the subject of the given formula using given values for variables.
	More Substitution in Formulae	Substitute values into the formulae and solve. Formulas involve fractions, square roots and squares.
	Equations= Simple Quadratics	Decide on the number of solutions then solve. Easier = (for example x squared = 100), Medium = (for example $3x$ squared = 27) H = negative integers.
NA4-8	**Generalise properties of multiplication and division with whole numbers.**	
	Arithmetic Laws	Identify the property of arithmetic shown and then calculate the value of the expression. Properties are= 'commutative property of multiplication', 'associative property of multiplication' and 'distributive property of multiplication'. Note that brackets are used.
	Equivalent Facts= Multiply	Students explore equivalent number relationships involving multiplication with the range of one to one hundred. Students must enter a missing number to maintain the balance of a number statement by using the law of commutativity or by doubling and or halving. At Easier level students only receive commutative problems, at Medium, doubling and halving problems, and at Harder the problems are mixed.

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New Zealand Algebra Level 4

AO	Activities Name	Description
NA4-9	**Use graphs, tables, and rules to describe linear relationships found in number and spatial patterns.**	
	Function Rules and Tables	Complete the table using a linear rule.
	Graphing from a Table of Values	Plot points from table of values and join the points to form a line.
	Find the Pattern Rule	Determine the rule connecting two variables given a table of values. All tables start with inputs 0, 1, 2, 3. Outputs are whole numbers including negative integers. Easier level involves rules with a single operation of multiplication, ie $y = mx$; Medium involves rules with a single operation of addition/subtraction , ie $y = x \pm c$, Harder involves rules of the form $y = mx + c$.
	Find the Function Rule	Determine the rule connecting two variables given a table of values. All tables start with inputs 0, 1, 2, 3. Outputs are whole numbers including negative integers. Easier level involves rules with a single operation of multiplication, ie $y = mx$; Medium involves rules with a single operation of addition/subtraction , ie $y = x \pm c$, Harder involves rules of the form $y = mx + c$.
	Pattern Rules and Tables	Complete the table using the given rule. Easier = is always in the format $x = 5b$, Medium = is always in the format $b = a + 4$, Harder = is always in the format $b = 2a + 4$.
	Graphing from a Table of Values 2	Plot the points given in a completed table of values on a Cartesian plane. Once plotted and submitted, the computer draws the line in.
	Reading Values from a Line	Complete the table by reading the coordinates from a straight line.
	Simultaneous Equations 1	Supports suggests elimination and substitution methods.
	Linear Modelling	Solve problems using the linear graph and equations provided.

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Mathletics

New Zealand Algebra Level 5

AO	Activities Name	Description
NA5-7	**Form and solve simple linear and quadratic equations**	
	Expanding with Negatives	Easier= expand with a negative integer multiplied by a binomial expression (note that the binomial expression consists of a single monic algebraic term and a negative constant), Medium= expand with a negative algebraic term multiplied by a binomial expression (note that the binomial expression consists of a single algebraic term and a negative constant), Harder= expand with a negative algebraic term multiplied by a trinomial expression (note that the trinomial expression consists of two algebraic terms (different variables) and a constant term).
	Expanding Brackets	Expanding brackets in algebra. Single positive algebraic term in front of bracket. Answers have indices of 2 or less.
	Factorising Expressions	Factorise an expression involving two terms and indices of up to 3. Highest common factor may include a positive numerical or algebraic term.
	Solving More Equations	Solve equations with pronumerals on both sides but no grouping symbols or fractions.
	Equations= Variables, Both Sides	Solve equations with pronumerals on both sides - decimal values included.
	Equations with Fractions	Solve equation with pronumerals on one side only.
	Writing Equations	Solve equations with pronumerals on both sides.
	Checking Solutions	Solve equations with pronumerals on both sides - substitute x to check if the solution is correct.
	Factorising with Indices	Factorise the algebraic expression with indices.
	Factorising with Negatives	Factorise an expression involving the sum or difference of two terms and indices of up to 3 by taking out the negative highest common factor. Highest common factor may be numerical or algebraic.
	Expand then Simplify	Expand the bracketed algebraic expressions
	Expanding Binomial Products	Select the correct answer to the expanded binomial products. Easier = $(x + 4)(x + 5)$, Medium = $(3x + 4)(x + 5)$, Harder = $(2x + 4)(6x + 2)$
	Special Binomial Products	Select the correct answer to the expanded binomial products. Easier = perfect squares, Medium = $(3x + 4)(x + 5)$, Harder = $(3x + 2y)$ squared.
	Factorising Quadratics 1	Monic quadratic trinomials.
	Quadratic Equations 1	Easier= all questions given in factored form, Medium= factorise a non-monic to solve equation, Harder= factorise a non-monic to solve the equation.
	Completing the Square	Complete the expansion and factorisation for perfect squares.

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Mathletics

New Zealand Algebra Level 5

AO	Activities Name	Description
NA5-7	**Form and solve simple linear and quadratic equations**	
	Constructing Formulae	Form a quadratic equation to solve a geometrical problem involving perimeter, area or Pythagoras' theorem.
	Checking Quadratic Solutions	Substitute values into a quadratic equation to check whether they are the correct solutions. Easier = substitute into equations of the form $x2 + bx = 0$, Medium = $x2 + bx + c = 0$ Harder = as for medium but with larger numbers.
	Monic Quadratic Trinomial Equations	Solve for x when the equation = 0...questions are either expressed as equations or in factorised form.
	Simple Quadratic Equations - How many solutions?	Decide on the type of equation it is - linear, quadratic or cubic - decide how many solutions it has.
	Algebraic Division	Divide two algebraic terms and simplify. Question uses ÷ but answers are always in fraction form. Questions can include one or two negative terms.
	Using the Distributive Property	Expanding brackets in algebra. Single positive or negative numerical constant in front of one set of brackets. Includes negative outside bracket.
	Factorising	Factorise an expression involving two or three terms. No indices higher than 1 in the given expression. Highest common factor is a positive or negative constant.
	Real Formulae	Calculate the subject of the given real life formula using given values for variables.
NA5-9	**Relate tables, graphs, and equations to linear and simple quadratic relationships found in number and spatial patterns.**	
	Breakeven Point	Use given equations and graphs to calculate various costs.
	Intercepts	Find x and y intercepts from equation of line, using algebra. Equations given in either $y=mx+b$ or general form.
	Horizontal and Vertical Lines	Find the equation for the straight line.
	Equation from Point and Gradient	Find the equation of a line given the gradient and the y intercept. Harder questions may have a negative or fractional gradient.
	Graphing Parabolas	Match a set of graphs of parabolas to their equations. Parabolas given in form $y = ax\text{^}2 + bx + c$.
	Solve Systems by Graphing	Identify the point of intersection of two straight lines.

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Mathletics

New Zealand Geometry Level 1

AO	Activities Name	Description
GM1-2	**Sort objects by their appearance.**	
	Collect the Shapes	Choose the correct 2D shapes to drag into the box - simple shapes.
	Match the Object	Choose from 3 objects (some 2D and 3D objects) the object that looks the same as the given one.
	Collect Simple Shapes	Choose the correct 2D shapes to drag into the box - simple shapes. Circles, triangles, rectangles and squares only.
	Same and Different	Select the object that is the same as the given object, or select the object that is different from the other objects shown.
	Sort It	Select the objects from a group of five objects that match the worded description, e.g. 'yellow and square' or 'red and round'. There may be more than one object that matches the description.
GM1-3	**Give and follow instructions for movement that involve distances, directions, and half or quarter turns.**	
	Following Directions	Use the language of up/down, left/right to find the way to another shape on a grid. Easier= 2 instructions, Medium= 3, Harder= 4
GM1-4	**Describe their position relative to a person or object.**	
	Left or Right?	Click to place the object to the left or right of the centre object.
	Where is it?	Move objects into the given position e.g. under, above, below, beside.

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Mathletics

New Zealand Geometry Level 2

AO	Activities Name	Description
GM2-3	**Sort objects by their spatial features, with justification.**	
	Collect the Shapes 1	Choose the correct 2D shape to drag into the square.
	Select the Objects	Choose the correct 2D shape to drag into the square.
	How Many Faces?	Identify the number of faces in prisms and pyramids.
	How many Edges?	Identify the number of edges in prisms and pyramids.
	Count the Corners	Identify the number of corners in prisms and pyramids.
	Collect More Shapes	Select the correct 2D shapes including circle, hexagon, rectangle, square and pentagon.
	Collect the Shapes 2	Select the correct 2D shapes including simple shapes such as: circle, hexagon, rectangle, square.
	Similar Figures 1	Select the shape that is similar to a given shape from a set of three other shapes. All shapes displayed on a line grid.
	Match the Solid 1	Select the 3D object that has the same shape as the real-life object shown. Cubes, cones, cylinders and spheres only.
	Count Sides and Corners	Drag the shape with the correct number of sides or corners into the square - basic 2D shapes.
	Match the Solid 2	Select the 3D object that has the same shape as the real-life object shown. Cubes, cones, cylinders and spheres only.
GM2-4	**Identify and describe the plane shapes found in objects.**	
	Relate Shapes and Solids	Select the picture of the 2D shape that is the same as the shaded 'face' of the 3D object shown. Solids include cubes, rectangular prisms, cones and cylinders.
GM2-5	**Create and use simple maps to show position and direction**	
	Using a key	Locate objects on a coordinate map (basic map with large squares), Easier= 4 objects, Medium= 6 objects, Harder= 8 objects.
GM2-7	**Predict and communicate the results of translations, reflections, and rotations on plane shapes.**	
	Flip, Slide, Turn	Uses the language of flip, slide, turn to describe the movement of shapes.
	Symmetry	Identify the symmetry of everyday objects/images.

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Mathletics

New Zealand Geometry Level 3

AO	Activities Name	Description
GM3-3	**Classify plane shapes and prisms by their spatial features.**	
	Collect the Objects	Choose the correct 3D object - cones, prisms, pyramids, cubes, spheres.
	Collect the Objects 1	Choose the correct 3D object to put on the table.
	Count the Faces	Identify the number of faces in prisms and pyramids.
	Count the Edges	Identify the number of edges in prisms and pyramids.
	How many vertices?	Identify the number of vertices in prisms and pyramids.
	Symmetry or Not?	Identify the shape that has the given number of axes of symmetry. Up to 6 axes of symmetry.
	Lines of Symmetry	Identify the shape that has the given number of axes of symmetry. Up to 6 axes of symmetry.
	Sides, Angles and Diagonals	Find the number of sides, angles and diagonals in 2D shapes.
	Faces, Edges and Vertices	Find the number of faces edges and vertices on the given prism.
	Faces, Edges and Vertices of 3D Shapes	Find the number of faces edges and vertices on the given prism.
	Shapes	Identify 2D shapes - includes more common shapes along with a decagon, quadrilateral and an ellipse.
	Triangle Tasters	Identify equilateral, isosceles, scalene triangles. Also right-angled triangles.
	Triangle - Tasters	Identify equilateral, isosceles, scalene triangles. Also right-angled triangles.
	Collect the Objects 2	Identify the 3D shapes: rectangular prism, cone, square pyramid, sphere, cylinder.
	Faces, Edges, and Vertices 1	Identify the number of faces, edges and vertices in prisms and pyramids.
GM3-4	**Represent objects with drawings and models.**	
	Labelling Angles	Label angles on diagrams using three points in capital letters. Includes some reflex angles.
GM3-5	**Use a co-ordinate system or the language of direction and distance to specify locations and describe paths.**	
	Coordinate Meeting Place	Select the correct square on a grid to match the given coordinate. Easier= 4 by 4 grid, Medium= 6 by 6 grid , Harder= 8 by 8 grid.
	What Direction was That?	Identify the correct direction (8 point compass).
	Map Coordinates	State the coordinates (C, 5) where the objects sits in the grid. Easier = 4 x 4 grid, Medium = 6 x 6 grid, Harder = 8 x 8 grid.
GM3-6	**Describe the transformations (reflection, rotation, translation, or enlargement) that have mapped one object onto another.**	
	Transformations	Use the language of translation, reflection and rotation to describe the movement of shapes.
	Rotational Symmetry	Select the shape with a given order of rotational symmetry.
	Rotational Symmetry of Shapes	Select the shape that does have rotational symmetry.

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Mathletics

New Zealand Geometry Level 4

AO	Activities Name	Description
GM4-5	**Identify classes of two- and three-dimensional shapes by their geometric properties.**	
	What Line am I?	Select the correct word (horizontal, vertical, parallel or perpendicular) to describe highlighted line(s) on a rectangle or right-angled trapezium.
	What pair of lines am I?	Select the correct word (horizontal, vertical or intersecting) to describe highlighted line(s) on a rectangle, right-angled trapezium or right triangle.
	What Pyramid am I?	Name the type of pyramid shown.
	What Prism am I?	Select the name of the given prism. Includes rectangular prisms, cubes, triangular prisms, pentagonal prisms, hexagonal prisms, octagonal prisms.
	Classifying Angles	Classify angles as acute, right, obtuse, reflex or an angle of revolution.
	Prisms and Pyramids	Select the correct prism or pyramid from the label given.
	Identify Prisms and Pyramids	Select the correct prism or pyramid from the label given.
	Collect the Polygons	Identify polygons, including a decagon and a quadrilateral.
	Labelling Circles	Label circles with the following parts: circumference, sector, radius, diameter, quadrant, semicircle, centre.
	Identify Parts of Circles 1	Label circles with the following parts: radius, diameter, centre.
	Euler's Formula	Complete the faces, edges, vertices of various 3D shapes using Euler's formula.
	Properties of Solids	Identify right and oblique prisms, cylinders, skew lines, names of prisms. Also includes properties of 2D shapes (i.e. concave polygon).
	Plane Figure Terms	State whether statements regarding various 2D shapes are true or false. Includes whether sides are equal or not, parallel or not.
	Plane Figure Theorems	Decide whether the theorems related to plane figure terms are true or false.
	Congruent Figures= Find Values	Identify corresponding sides and angles of congruent triangles.
	Triangles= Acute, Right, Obtuse	Decide whether a triangle has acute, obtuse or right-angles.
	Identify Parts of Circles 2	Label circles with the following parts: radius, centre, diameter, central angle, chord.
	Properties of Quadrilaterals	Select all true statements regarding the properties of regular quadrilaterals e.g. square, rhombus, trapezium. Uses language such as 'right angle', 'intercepting', 'adjacent.
	Naming 3D objects	Choose from adjective and noun to describe 3D objects , including prisms and pyramids.
	Naming 3D solids	Choose from adjective and noun to describe 3D objects , including prisms and pyramids.

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Mathletics

New Zealand Geometry Level 4

AO	Activities Name	Description
GM4-6	**Relate three-dimensional models to two-dimensional representations, and vice versa.**	
	Nets	Transfer the dimensions of triangular prisms and cylinders to a net of the solid.
	Elevations	Match house plans with elevation drawings.
GM4-7	**Communicate and interpret locations and directions, using compass directions, distances, and grid references.**	
	More Directions!	Using 16 points on a compass - describe various pathways.
	Scale	Calculate the distance between two points on a grid using a given scale.
	Ordered Pairs	Identify the coordinates for points on a Cartesian plane.
	Coordinate Graphs	Work out the coordinates of a point on a graph, harder questions use negative coordinates.
	Coordinate Graphs= 1st Quadrant	Give the x and y coordinates of the point shown.
	Latitude and Longitude	Select the correct coordinates for points on the globe.
	Vertical and horizontal shift	Translate coordinates on Cartesian plane horizontally or vertically.
GM4-8	**Use the invariant properties of figures and objects under transformations (reflection, rotation, translation, or enlargement)**	
	Transformations= Coordinate Plane	Identify translations on a coordinate plane.
	Rotations= Coordinate Plane	Determine the angle of rotation.
	Scale Factor	Decide whether an image has been enlarged, reduced or is congruent and then work out the scale factor.

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New Zealand Geometry Level 5

AO	Activities Name	Description
GM5-5	**Deduce the angle properties of intersecting and parallel lines and the angle properties of polygons and apply these properties.**	
	Angles in a Revolution	Find the value of the unknown in the diagram given three or more angles at a point. Unknown may have coefficient of 1 or more. Unknown may have a constant added/subtracted to it.
	Parallel Lines	Identify alternate, corresponding and co-interior angle pairs on pairs and sets of parallel lines.
	Equal, Complement or Supplement?	Classify angles in a diagram as complementary, supplementary or equal. Determine the size of an unknown angle, given the size of another. Requires knowledge of angles in a right angle and straight angle, and also vertically opposite angles.
	Angles and Parallel Lines	Find the value of the unknown in the diagram given a pair of parallel lines and a transversal. Provide a reason by selecting from a group of three provided reasons.
	Angle Sum of a Triangle	Calculate the angle sum of triangle.
	Exterior Angles of a Triangle	Easier = find x: exterior angle (sum of the two opposite interior angles), Medium = the exterior angle is in the form $x + 8$ or $2x$, Harder = find the missing interior angle.
	Angle Sum of a Quadrilateral	Easier = find the missing interior angle, Medium = find the missing interior angle in the form $x + 12$ or $2x$, Harder = find the 2 missing angles in the form $x + 12$ or $2x$.
	Interior and Exterior Angles	Find the interior angles of regular 2D shapes.
	Introduction to Angles on Parallel Lines 3	Easier = find co-interior angle, alternate angle or corresponding angle to given angle, Medium = as for Easier questions but lines are not set up horizontally and vertically, Harder = 2 sets of parallel lines rather than one set intercepted by one line as in Easier and Medium.
	Are the lines parallel?	Use corresponding, alternate and co-interior angle rules to decide if a pair of lines are parallel or not.
	Vertically Opposite= Unknown values	Use angle properties e.g. vertically opposite angles are equal and angles on a straight line add to 180 to find unknown values.
GM5-7	**Construct and describe simple loci.**	
	Number Plane	Find points on an unmarked number plane; find the x axis, y axis, the origin.
	Determining a Rule for a Line	Determine the equation of a straight line plotted on the Cartesian plane. Equations in the form $y=mx+b$.
	Which Straight Line?	Match the equation of a set three straight lines given their graphs on the Cartesian place. Equations in the form $y=mx+b$.
	Modelling Linear Relationships	Find gradient and y-intercept and then equation from the line on the graph. Values are rounded decimals.

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Mathletics

New Zealand Geometry Level 5

AO	Activities Name	Description
GM5-8	**Interpret points and lines on co-ordinate planes, including scales and bearings on maps.**	
	Vectors with Grid (Component)	Write the component form of a vector shown on a Cartesian plane. Split the horizontal and vertical components of the vector and observe the direction.
GM5-9	**Define and use transformations and describe the invariant properties of figures and objects under these transformations**	
	Horizontal and Vertical Change	Translate coordinates on Cartesian plane horizontally or vertically.
GM5-10	**Apply trigonometric ratios and Pythagoras' theorem in two dimensions.**	
	Pythagoras' Theorem	Calculate the length of the hypotenuse or a shorter side in the right-angled triangle using Pythagoras' theorem. Easier and medium questions are all hypotenuse questions, harder questions are all shorter side questions. Rounding may be required.
	Hypotenuse of a Right Triangle	Calculate the length of the hypotenuse of a right-angled triangle using Pythagoras' theorem. Student must provide both the value of the square of the hypotenuse and the length of the hypotenuse. All values whole numbers. No rounding.
	Hypotenuse, Adjacent, Opposite	Identify the parts of the triangles related to the given terms.
	Sin A	Use the sine ratio to find the unknown angle or side. Easier= use sine to find the unknown angle as a decimal, correct to 2 decimal places, Medium= use sine to find the opposite side (i.e. unknown in numerator). Answer correct to 2 decimal places, Harder= use sine to find the hypotenuse (i.e. unknown in denominator). Answer correct to 2 decimal places.
	Cos A	Use the cosine ratio to find the unknown angle or side. Easier= use cosine to find the unknown angle as a decimal, correct to 2 decimal places, Medium= use cosine to find the opposite side (i.e. unknown in numerator). Answer correct to 2 decimal places, Harder= use cosine to find the hypotenuse (i.e. unknown in denominator). Answer correct to 2 decimal places.
	Pythagorean Theorem	Calculate the length of the hypotenuse or a shorter side in the right-angled triangle using Pythagoras' theorem. Questions are mixed and non-adaptive so students get a mixture of hypotenuse and short side questions in any order. All answers are whole numbers. No rounding required.
	Tan A	Use the tangent ratio to find the unknown angle or side. Easier= use tan to find the unknown angle as a decimal, correct to 2 decimal places, Medium= use tan to find the opposite side (i.e. unknown in numerator). Answer correct to 2 decimal places, Harder= use tan to find the hypotenuse (i.e. unknown in denominator). Answer correct to 2 decimal places.

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Mathletics

New Zealand Geometry Level 5

AO	Activities Name	Description
GM5-10	**Apply trigonometric ratios and Pythagoras' theorem in two dimensions.**	
	Find Unknown Angles	Use trigonometric ratios to find the unknown angle. Easier = a hint shows with trig ratio to use, Medium = a hint shows all trig ratios, Harder = no hint given.
	Find Unknown Sides	Use trigonometric ratios to find the unknown side. Easier = a hint shows with trig ratio to use, Medium = a hint shows all trig ratios, Harder = no hint given.
	Bearings	Use trigonometric ratios to calculate the unknown value in questions involving distance (km) and bearings (degrees).
	Trigonometry Problems 2	Use trigonometric ratios to find an unknown distance - select the correct steps needed to solve the problem.
	True and Compass Bearings	Convert between compass bearings and true bearings and vice versa.
	Pythagoras and Perimeter	Find the perimeter of right-angled triangles and right-angled trapeziums using Pythagoras' theorem (finding either hypotenuse and short side). All lengths are whole numbers and all calculations result in whole numbers (i.e. Pythagorean triads are used throughout). Units are metric cm, mm, m.
	Cone and Pyramid dimensions	Find the slant height or height of cones and pyramids using trigonometric ratios. Harder questions require finding the radius of the base of the cone first using the circumference.
	Pythagoras= Find a Short Side - integers only	Calculate the missing side length using Pythagoras. Uses 2 digit or 3 digit numbers.
	Pythagoras= Find a Short Side - with rounding	Calculate the missing side length using Pythagoras. Uses 1 or 2 digit numbers. Round to 1 or 2 decimal places.

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Mathletics

New Zealand Measurement Level 1

AO	Activities Name	Description
GM1-1	**Order and compare objects or events by length, area, volume and capacity, weight (mass), turn (angle), temperature, and time by direct comparison and/or counting whole numbers of units.**	
	How Full?	Choose whether various containers/scales show empty, nearly empty, half full, nearly full or full.
	Days of the Week	Choose the correct day of the week for 'tomorrow', 'yesterday'...'2 days before' etc.
	Everyday Mass	Compare the individual scales on which two, three or four objects are placed to determine the lightest or heaviest object. Scales are marked with 'light' and 'heavy' at each end and no numerals.
	Balancing Act	Select an object to place on the balance scales to make them balanced.
	Comparing Length	Compare a group of up to seven lines to determine the longest, 2nd longest, 3rd longest, etc. or the shortest, 2nd shortest, 3rd shortest....
	Filling Fast!	Choose the vessel that will fill first, second or last.
	Everyday Length	Compare everyday objects to determine the shortest, longest, widest, thinnest...
	Comparing Volume	Click on the largest box/2nd largest etc.
	Balancing Objects	Select an object to place on the balance scales to make them balanced.
	Hot or Cold?	Choose between 2 everyday objects - click on the object that is hot or cold.
	Compare Length	Measure and compare objects using uniform informal units.
	Compare Length 1	Measure and compare objects using uniform informal units.
	Which Holds More?	Compare the sizes of two glasses - choose the one that would hold more.
	Which Measuring Tool?	Choose the right measuring 'tool' to match the measurement type.
	Measuring Length with Blocks	Use uniform informal units to measure length. Includes an initial estimate and then the ability to line up the blocks against the object to measure it.
	Tell Time to the Hour (UK)	Tell time to the hour using an interactive analogue clock.

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Mathletics

New Zealand Measurement Level 2

AO	Activities Name	Description
GM2-1	**Create and use appropriate units and devices to measure length, area, volume and capacity, weight (mass), turn (angle), temperature, and time.**	
	1st to 31st	Select the corresponding number on a calendar for the ordinal number.
	Months of the Year	Month names are presented and students identify the months that come before/after depending upon the instructions. Easier= what month is next or before, Medium= 2 months, Harder= 3 months.
	Biggest Shape	Compare the areas of two rectangles on a grid background. Numerical values for side lengths are not provided.
	How Long is That?	Measure the length of everyday objects to the nearest centimetre using a movable ruler marked in centimetres only.
	How Heavy is it?	Drag the object onto the scales and read the scale to record the weight of a object in grams, using symbol (g). Scale graduated in five-gram increments with numerals shown for each multiple of ten. Answers are multiples of five between 0 and 100 grams only.
	Using a Calendar	Choose the day of the week it will be on a certain date; month shown.
	Five Minute Times	Skip count in fives to read the time on the analogue clock.
	Using a Litre	Read scales relating to capacity. Easier= more than half, less than half, half, empty, Medium and Harder = read the scale to 250ml 500ml 750ml or 1000ml.
	Quarter To and Quarter Past	Move the hands on an analogue clock to create the given time (quarter past and quarter to only).
	Which Unit of Measurement?	Consider an everyday object and choose the best unit of measurement. Length= choose between mm, cm and m. Capacity= choose between ml and L. Weight= choose between g and Kg.
	Tell Time to the half Hour (UK)	Tell time using an interactive analogue clock.
	Months After and Before	Easier = what 3 months come after a given month (put them in order), Medium = before and after, Harder = which 3 months come before
GM2-2	**Partition and/or combine like measures and communicate them, using numbers and units.**	

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Mathletics

New Zealand Measurement Level 3

AO	Activities Name	Description
GM3-1	**Use linear scales and whole numbers of metric units for length, area, volume and capacity, weight (mass), angle, temperature, and time.**	
	How Heavy?	Drag the object onto the scales and read the scale to record the weight of an object in grams, using symbol (g). Scale graduated in ten-gram increments with numerals shown for each marker. Answers are multiples of ten between 0 and 100 grams only.
	What Type of Angle?	Classify an angle as either an 'acute angle', 'right angle' or 'obtuse angle'.
	What Type of Angle 2?	Decide whether an angle is acute, right or obtuse.
	Right Angle Relation	Classify angles as right angles, or less than or greater than a right angle.
	Comparing Angles	Compare two angles to select either the smaller or larger angle as asked. Then compare four angles to select the smallest, second smallest, third smallest, largest, second largest, third largest angle.
	Grams and Kilograms conversion	Convert between kilograms and grams- no decimals.
	Equal Areas	Compare the areas of up to five rectangles on a grid background to determine which two shapes have equal area. Rectangles of equal area may not have the same dimensions.
	What is the Time?	Tell the time by reading an analogue clock. Easier = half hour and hour, Medium = 5 minute intervals, Harder = to the minute.
	Perimeter of Shapes	Find the perimeter of rectangles displayed on a 10 cm by 10 cm grid with the dimensions given beside two of the sides. All lengths are whole numbers in centimetres. Maximum perimeter = 40 cm.
	Perimeter	Find the perimeter of rectangles displayed on a 10 cm by 10 cm grid with the dimensions given beside two of the sides. All lengths are whole numbers in centimetres. Maximum perimeter = 40 cm.
	Measuring Length	Measure the length of everyday objects to the nearest millimetre using a movable ruler marked in centimetres and millimetres. Answers in centimetres correct to the nearest millimetre, i.e. in decimals.
	Using Timetables	Read a train timetable (showing times to the nearest minute) and state what time trains arrive at a destination or how long it takes them to travel from one place to another.
	Measuring Angles	Read the size of the angle using the 360 degree protractor underlay.
	24 Hour Time	Convert between 12 hour and 24 hour times.
	What's the Temperature (Celsius)?	Read temperature on a thermometer (Celsius).
	Metres and Kilometres	Convert between kilometres and metres (no decimals).

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New Zealand Measurement Level 3

AO	Activities Name	Description
GM3-1	**Use linear scales and whole numbers of metric units for length, area, volume and capacity, weight (mass), angle, temperature, and time.**	
	Angles of revolution= Unknown Values	Find the unknown value - angle of revolution.
	Measure to the Nearest Half Centimetre	Move an interactive ruler to measure objects to the nearest half centimetre.
GM3-2	**Find areas of rectangles and volumes of cuboids by applying multiplication.**	
	Area of Shapes	Calculate the areas of rectangles and squares on a grid background. Numerical values for side lengths are provided in centimetres.
	How many Blocks?	Calculate the number of blocks required to construct the prism.
	Volumes of Solids and Prisms 1cm cubed blocks	Calculate the volume of an object by counting the 1cm3 blocks.

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Mathletics

New Zealand Measurement Level 4

AO	Activities Name	Description
GM4-1	**Use appropriate scales, devices, and metric units for length, area, volume and capacity, weight (mass), temperature, angle, and time.**	
	Estimating Angles	Estimate the size of a given angle, including reflex angles.
	Angle Measures in a Triangle	Find the missing angles in triangles. Unknowns may occur more than once in triangle.
	Similar Figures	Identify the angle or side that corresponds to the marked angle or side in a similar triangle.
GM4-2	**Convert between metric units, using whole numbers and commonly used decimals.**	
	Grams and Kilograms	Convert between grams and kilograms. Includes decimals of up to 2 places in the Harder questions.
	Converting cm and mm	Convert between centimetres and millimetres. Includes decimals to 1 place in the Harder questions.
	Kilogram Conversions	Convert from kilograms to grams. No decimals required.
	Litre Conversions	Convert between litres and millilitres. No decimals required.
	Kilometre Conversions	Convert from kilometres/metres form to metres only, or from metres only to kilometres/metres form. No decimals.
	Capacity Addition	Convert between units of capacity and then add (up to 2 decimal places).
	Converting Units of Mass	Convert between units of mass, including grams, kilograms and tonnes. Decimals are used.
	Mass Addition	Addition of two weight measurements. Requires addition of decimals and conversion between grams and kilograms. Easier = one decimal place, Medium and Harder = more than one decimal place.
	Operations with Length	Easier = convert between mm and cm before adding (to one decimal place), Medium = convert between m and cm (to 2 decimal places), Harder = addition and subtraction with 3 numbers....convert between km and m (to 3 decimal places).
	Grams and Milligrams	Convert between Grams and Milligrams. Includes decimals of up to 3 places in the Harder questions.

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Mathletics

New Zealand Measurement Level 4

AO	Activities Name	Description
GM4-3	**Use side or edge lengths to find the perimeters and areas of rectangles, parallelograms, and triangles and the volumes of cuboids.**	
	Perimeter= Squares and Rectangles	Calculate the perimeter of squares and rectangles. Side lengths can be decimals (.5 units only). Metric units of metres, centimetres and millimetres are used.
	Calculate Perimeter of Squares and Rectangles	Calculate the perimeter of squares and rectangles. Side lengths can be decimals (.5 units only). Metric units of metres, centimetres and millimetres are used.
	Perimeter= Triangles	Perimeter of triangles, including equilateral, isosceles and scalene triangles. All side lengths provided in mm, cm, m. Decimals to one decimal place are used.
	Area= Squares and Rectangles	Calculate the area of squares and rectangles given numerical values for side lengths. Units are m, cm and mm. Side lengths are whole numbers of up 2-digits.
	Calculate area of squares and rectangles.	Calculate the area of squares and rectangles given numerical values for side lengths. Units are m, cm and mm. Side lengths are whole numbers of up 2-digits.
	Area= Triangles	Right-angled triangles only. Determine the area of right-angled triangles. Side lengths given as whole numbers of up to 2 digits. Answers may be decimals, harder questions show side lengths on all three sides of the triangle. Units are metric.
	Area of Triangles	Right-angled triangles only. Determine the area of right-angled triangles. Side lengths given as whole numbers of up to 2 digits. Answers may be decimals, harder questions show side lengths on all three sides of the triangle. Units are metric.
	Volume= Rectangular Prisms 1	Calculate the volume of a rectangular prism given its three dimensions. All side lengths are whole numbers of up to 2 digits. Units are cubic mm, cm, m. No conversion of units required.
	Volume of Rectangular Prisms 1	Calculate the volume of a rectangular prism given its three dimensions. All side lengths are either single digit whole numbers or 2-digit multiples of ten. Units are cubic mm, cm, m, Harder questions require the conversion of units first.
	Volume= Cuboid 1	Calculate the volume of a cuboid. No conversion between units is required, Harder questions = 2-digit dimensions.
	Area= Right Angled Triangles	Right-angled triangles only. Easier = determine the area of triangles with whole number side lengths and all measurements given in the same units, Medium = find the area of triangles with side lengths measured in different units, Harder = determine the area of triangles with decimal side lengths, conversion of units is required.
	Volume= Rectangular Prisms 2	Calculate the volume of a rectangular prism given its three dimensions. Units need to be converted first.

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New Zealand Measurement Level 4

AO	Activities Name	Description
GM4-3	**Use side or edge lengths to find the perimeters and areas of rectangles, parallelograms, and triangles and the volumes of cuboids.**	
	Volume= Cuboid 2	Calculate the volume of a cuboid given its three dimensions. Units need to be converted first.
	Perimeter= Triangles 2	Calculate the perimeter of triangles, including equilateral, isosceles and scalene triangles. All side lengths provided in mm, cm, m. Decimals to one decimal place are used.
	Floor Plans	Calculate the actual dimensions of the room drawn. Dimensions are in mm and must be converted to m.
	Perimeter Detectives 2	Find the perimeter of a larger rectangle that is divided into a number of smaller rectangles, given various side lengths of the smaller rectangles. Includes decimals. Units are metric cm, m, mm.
	Area= Parallelograms (Metric)	Using the base and perpendicular height students are asked to find the area of a parallelogram (metric), Harder questions = 2 digit numbers.
	Perimeter= Triangles 1	Perimeter of triangles, including equilateral, isosceles and scalene triangles. All side lengths provided in mm, cm, m. Decimals to one decimal place are used.
	Perimeter Detectives 1	Find the perimeter of a larger rectangle that is divided into a number of smaller rectangles, given various side lengths of the smaller rectangles. All lengths are whole numbers of up to 2 digits. Units are metric cm, m, mm.
GM4-4	**Interpret and use scales, timetables, and charts.**	
	Time Mentals	Calculate the time difference between two times shown on digital clock. Easier = hours and minutes (in multiples of 10), Medium = hours and minutes (multiples of 5), Harder = hours and minutes (could be any minute e.g. 34), time may go from AM to PM or vice-versa.
	Elapsed Time	Calculate the time difference between two times shown on analogue clocks.
	What Time Will it Be?	Easier= add hours and minutes to a given time - state whether it is AM or PM, Medium= slightly harder additions, Harder = state the new day and time after adding a large amount of hours and minutes to the original time.
	Time Zones	Read a table with 24 hour times showing times from cities around the world. Easier = calculate the time difference between cities, Medium = e.g. what time is it in Moscow when it is 9:20am in London?, Harder = work out the local arriving time taking into account the flight time.
	Hours and Minutes	Convert hours to minutes, harder questions require finding fractions of the hour.

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New Zealand Measurement Level 5

AO	Activities Name	Description
GM5-1	**Select and use appropriate metric units for length, area, volume and capacity, weight (mass), temperature, angle, and time, with awareness that measurements are approximate.**	
GM5-2	**Convert between metric units, using decimals.**	
	Millilitres and Litres	Convert between millilitres and litres and vice versa. Decimals of up three decimal places.
	Metres and Kilometres	Convert from kilometres to metres. Decimals can be up to 3 decimal places.
	Converting Units of Length	Convert between mm, cm and m. Decimals are up to 2 or 3 places.
	Converting Units of Area	Convert between cm2 and m2. Multiply or divide by 10 000 to convert. Easier = no decimals needed, Medium = up to 3 decimal places, Harder = convert between mm2 and cm2.
	Converting Volume	Convert between cm3 and mm3. Multiply or divide by 1000 to convert. Easier = no decimals needed, Medium = up to 3 decimal places, Harder = convert between m3 and cm3.
	Capacity Word Problems	Interpret a statement about the volume of an object and convert from units of volume into specified units of capacity. Likewise, interpret a statement about the capacity of a container and convert from units of capacity into specified units of volume.
	Nautical Mile, Kilometre, Knot	Convert between knots, nautical miles and kilometres.
	Scale Measurement	Measure the object then convert the measurement using the scale. The scale gets increasingly harder.
	Centimetres and Metres	Convert between centimetres and metres. Easier = no decimals, Medium= 2 decimal places, Harder = 3 decimal places.
GM5-3	**Deduce and use formulae to find the perimeters and areas of polygons and the volumes of prisms.**	
	Surface Area= Cuboids	Easier = calculate the surface area of a cube, Medium = calculate the surface area of a rectangular prism, Harder = same as for Medium however the side lengths need to be converted to the same units of measurement.
	Volume: Triangular Prisms	Easier = area of the triangle provided, Medium= only side lengths provided, Harder= use Pythagoras' theorem to calculate a missing side before finding the volume.
	Volume of Triangular prisms	Calculate the volume of a triangular prism. Students are sometimes given the area of the triangle but other times this needs to be calculated first.
	Area= Quadrilaterals	Calculate the area of quadrilaterals, includes trapeziums, parallelograms and kites.
	Volume= Prisms	Calculate the volume of prisms, includes irregular prisms.

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Mathletics

New Zealand Measurement Level 5

AO	Activities Name	Description
GM5-3	**Deduce and use formulae to find the perimeters and areas of polygons and the volumes of prisms.**	
	Field Diagrams	Calculate the area of irregular quadrilaterals.
	Surface Area= Square Pyramids	Calculate the surface area of square pyramids. Side lengths are decimals to one decimal place.
GM5-4	**Find the perimeters and areas of circles and composite shapes and the volumes of prisms, including cylinders.**	
	Area= Composite Shapes	Calculate the area of composite shapes comprised of rectangles and triangles. Includes the addition and subtraction of areas. Units are centimetres and square centimetres.
	Calculate circumference of circles	Calculate the circumference of a circle (using calculator value for pi).
	Circumference= Circles	Calculate the circumference of a circle (uses 3.14 for pi)
	Area= Circles 1	Calculate the area of a circle. Easier = radius given in cm (from 1 - 15), Medium = diameter given in cm (from 1 - 15), Harder = calculate the area of the quadrant.
	Surface Area= Rectangular Prisms	Calculate the surface area of a rectangular prism. Easier = calculate the surface area of a cube, Medium = calculate the surface area of a rectangular prism, Harder = same as for medium however the side lengths need to be converted to the same units of measurement.
	Volume= Cylinders	Calculate the volume of a cylinder (using calculator pi).
	Surface Area= Cylinders	Calculate the surface area of a cylinder using dimensions of 1 or 2 digits and in cm.
	Perimeter and Circles	Find the perimeter of a semicircle, quadrant or sector (i.e. arc + radii). Angles expressed in degrees. Uses calculator value for pi.
	Surface Area= Triangular Prisms	Calculate the surface area of a triangular prism. Harder questions require students to use Pythagoras to find a missing side before calculating the surface area.
	Circle Terms	Students choose the term corresponding to an image shown. Terms include centre, radius, diameter, circumference, chord, tangent, sector, minor segment, arc, semicircle, quadrant and major segment.
	Area= Sectors (Degrees)	Find the area of a semi-circle, quadrant or a sector of a circle.
	Area= Annulus	Calculate the area of an annulus with the diameter or the radii showing.
	Arc Length	Find the lengths of arcs of circles. All angles expressed in degrees.
	Perimeter= Composite Shapes	Calculate the perimeter of regular and irregular shapes. Not all side lengths are given in some cases.
	Volume= Composite Figures	Calculate the volume of composite figures, includes prisms, spheres, cones.

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New Zealand Probability Level 2

AO	Activities Name	Description
S2-3	**Investigate simple situations that involve elements of chance, recognising equal and different likelihoods and acknowledging uncertainty.**	
	Possible Outcomes	Determine the number of possible combinations if you choose one item from each of two groups. Up to 6 items in each of two groups.
	Fair Games	Decide if the spinner shown is fair (the spinner is sectioned into colours).

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New Zealand Probability Level 3

AO	Activities Name	Description
S3-3	**Investigate simple situations that involve elements of chance by comparing experimental results with expectations from models of all the outcomes, acknowledging that samples vary.**	
	How many Combinations?	Determine the number of possible combinations if you choose one item from each of two groups. Up to 6 items in each of two groups.
	Chance Dial	Rate the chance of certain events happening on 5-point scale= impossible, less likely, even, likely and certain.
	Will it Happen?	Rate the chance of events happening on a 3-point scale= won't, might, will happen.
	Introductory Probability	All questions state 'A bag contains # marbles and # of the marbles are a certain colour'. Determine the probability of choosing that colour marble from the bag.
	Complementary Events	Easier = the probability of an event occurring is provided as a fraction - find the probability of the event not occurring (as a fraction) e.g. 9/10 and 1/10, Medium & Harder = work out the probability of an event occurring and not occurring - represent in fraction form.
	Counting Principle	Determine the number of possible combinations if you choose one item of clothing from each of two groups. Up to 6 items in each of two groups.

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New Zealand Probability Level 4

AO	Activities Name	Description
S4-3	**Investigate situations that involve elements of chance by comparing experimental distributions with expectations from models of the possible outcomes, acknowledging variation and independence.**	
	Counting Techniques 1	Work out how many combinations of dinner choices there are from a list of entrées, mains and desserts.
	Probability Scale	Rate statements on a 7-point scale= impossible, very unlikely, unlikely, roughly even, likely, very likely, certain.
S4-4	**Use simple fractions and percentages to describe probabilities.**	
	Simple Probability	Easier= Determine the number of items in the group given the probability of randomly selecting that item from the group. All probability denominators match the number of items in the group, Medium/Harder= Determine the theoretical probability of simple and compound events. Basic knowledge of notions of 'or' and 'and' necessary. Knowledge of the composition of a standard pack of 52 playing cards is required. All answers given as fractions, some answers require simplification.
	Probability Tables	Use a two way table to calculate probabilities. Easier= calculate the probability of an event occurring, Medium= calculate the probability of an event not-occurring, Harder= calculate the probability of 2 events occurring.
	Relative Frequency	Determine the experimental probability based on the results of a given experiment. The table of results shows score, frequency and relative frequency for each score. Relative frequencies are expressed as decimals. Easier= read the appropriate relative frequency from the table, Medium= find the relative frequency of a compound event, using term 'or', Harder= determine the number of expected frequency from the observed/relative frequency.
	Venn Diagrams	Use the given information to complete a Venn diagram consisting of two sets, then find the probability of an event from the diagram. Answers in decimal form, rounded to 2 decimal places.
	Dice and Coins	Determine the probability for simple and compound events resulting from either (1) rolling two dice; (2) rolling a die and tossing a coin; (3) tossing two coins. All sample spaces are shown in tabular form. All answers expressed as fractions in simplest form.
	Find the Probability	Determine the probability of simple events, e.g. drawing a particular coloured marble from a bag; selecting a student who plays a certain sport from the class; rolling a particular number on a 'number cube'; selecting a particular card from a set of numbered cards.

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New Zealand Probability Level 5

AO	Activities Name	Description
S5-4	Calculate probabilities, using fractions, percentages, and ratios.	
	Probability With Replacement	Select the correct probability for various scenarios involving jelly beans in a jar. Calculate individual probabilities and then multiply to get the final probability.
	Probability - Replacement	Select the correct probability for various scenarios involving jelly beans in a jar. Calculate individual probabilities and then multiply to get the final probability.
	Probability Without Replacement	Select the correct expression for the probability of a two-stage event without replacement. Each scenario is a jar of 16 jellybeans with three different colours and in each case, the probability required involves two different colours.
	Probability - No Replacement	Select the correct probability for various scenarios involving jelly beans in a jar. Calculate individual probabilities and then multiply to get the final probability. Students must remember that the total will change each time as the jelly beans are not being replaced.

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New Zealand Statistic Level 1

AO	Activities Name	Description
S1-1	**Conduct investigations using the statistical enquiry cycle: - posing and answering questions - gathering, sorting and counting, and displaying category data - discussing the results**	
	Picture Graphs= Who has the Goods?	Reading a basic pictogram. Choose the row of objects that has either e.g. '5 in it' or 'most' or 'few' - up to 10.
	Picture Graphs= single-unit scale	Read a simple picture graph and state the number of objects.
	Reading from a Column Graph	Read a basic column graph and state who has more, fewer, most, least.
	Bar Graphs 2	Read a basic bar graph and state who has more, fewer, most, least.
	Picture Graphs= More or Fewer?	Choose who has more or less objects by reading a picture graph - up to 5 objects.

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New Zealand Statistic Level 2

AO	Activities Name	Description
S2-1	**Conduct investigations using the statistical enquiry cycle: - posing and answering questions - gathering, sorting, and displaying category and whole-number data - communicating findings based on the data**	
	Making Picture Graphs= with scale	Add objects into a pictograph (using a key) to represent the data given. Easier= key is 1 , Medium= key is in 10s, Harder= key is in 10 and 5s (half objects).
	Sorting Data	Choose the column that does not represent the objects shown.
	Analysing data	Choose the column that does not represent the objects shown.
	Tallies	Count a group of objects then decide whether the tally marks representing the group are true or false.
	Picture Graphs= with scale & half symbols	Use a basic key to read a pictograph.
	Picture Graphs= with scale	Read and interpret a pictograph. Easier= key = 1, Medium= key = 10, Harder= key = 10.
	Column Graphs	Read a basic column graph. Easier = e.g. how many books does Michael have?, Medium = as for Easier, however the scale on the graph goes up in 2s and the bars may sit halfway between 2 numbers on the scale, Harder = requires adding 2 amounts together.
	Bar Graphs 1	Easier = e.g. how many books does Michael have?, Medium = as for Easier, however the scale on the graph goes up in 2s and the bars may sit halfway between 2 numbers on the scale, Harder = requires adding 2 amounts together.
	Bar Chart	Easier = e.g. how many books does Michael have? (read the scale), Medium = as for Easier, however the scale on the graph goes up in 2s and the bars may sit halfway between 2 numbers on the scale, Harder = requires adding 2 amounts together.
	Interpreting Tables	Interpret a table showing the favourite colours of boys and girls. Easier = e.g. how many boys liked green?, Medium = e.g. how many children liked orange?, Harder = e.g. how many children were surveyed?
	Reading from a Bar Chart	Read a bar chart. Easier = identify who has the most or fewest, Medium = who has fewer than....Harder = who has 3 more than...
	Add and Subtract Using Graphs	Read a pictograph - add the totals and find the difference between totals.
	Tally Charts	Interpret a tally chart.

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New Zealand Statistic Level 3

AO	Activities Name	Description
S3-1	**Conduct investigations using the statistical enquiry cycle: - gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions - identifying patterns and trends in context, within and between data sets - communicating findings, using data displays**	
	Line Plots	Interpretation of line plots (akin to dot plots with crosses instead of dots). Questions ask for highest and lowest data values, number of data values, identification of outliers. Temperatures in degrees Fahrenheit.
	Double Stem and Leaf Plots	Interpretation of stem-and-leaf plots. Questions ask for the number of particular data values, the mode, the range. But no median or mean.
	Carroll Diagram	Place a large set of numbers into a Carroll diagram (two-way table) with two categories on each axis.
	Grouping data and modal class	Given a set of data, students are asked to group the data. Easier = complete the grouped frequency table, Medium = identify the modal class, Harder = calculate the mean.

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New Zealand Statistic Level 4

AO	Activities Name	Description
S4-1	Plan and conduct investigations using the statistical enquiry cycle: - gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions - identifying patterns and trends in context, within and between data sets - communicating findings, using data displays	
	Line Graphs= Interpretation	Easier = read the scale on the graph to answer basic questions e.g. what was the population in 1995? Medium = calculate the range, Harder = use the scale to work out differences between amounts on the graph, e.g. what is the difference in population between 1995 and 2000?
	Line Graphs= Reading	Easier = read the scale on the graph to answer basic questions e.g. what was the population in 1995? Medium = calculate the range, Harder = use the scale to work out differences between amounts on the graph, e.g. what is the difference in population between 1995 and 2000?
	Line Graphs= Explanation	Easier = read the scale on the graph to answer basic questions e.g. what was the population in 1995? Medium = calculate the range, Harder = use the scale to work out differences between amounts on the graph, e.g. what is the difference in population between 1995 and 2000?
	Sector Graphs	Interpret sector graphs. Sector values labelled with numerical value or percentage of whole. Some questions require finding a percentage of a quantity.
	Circle Graphs	Interpret sector graphs. Sector values labelled with a numerical value or a percentage of the whole. Some questions require finding a percentage of a quantity.
	Divided Bar Graphs	Interpret divided bar graphs. Bar values labelled with numerical value or percentage of whole. Some questions require finding a percentage of a quantity. Money values in $
	The Mean	Calculate the mean from a list of up to seven data values. All data values are 1- or 2-digit whole numbers. Answers always whole numbers.
	The Median	Determine the median of a list of up to seven data values. Data values are not given in ascending order. List may include an even or odd number of data values. No data values are repeated. All answers are whole numbers.
	Sector Graph Calculations	Complete calculations using information on a sector graph. Involves the unitary method with percentages.
	Step Graphs	Answer basic questions regarding information on a sector graph (using the key).
	Travel Graphs	Read the information on the travel graph to answer the question. Easier = e.g. what is the distance after a given time, Medium = requires recognising how the slope of the graph represents speed, Harder = calculate the speed.

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New Zealand Statistic Level 4

AO	Activities Name	Description
S4-1	**Plan and conduct investigations using the statistical enquiry cycle: - gathering, sorting, and displaying multivariate category and whole number data and simple time-series data to answer questions - identifying patterns and trends in context, within and between data sets - communicating findings, using data displays**	
	Frequency Histograms	Read and answer questions from a frequency histogram. Includes calculation of the range.
	Histograms	Read and answer basic questions using a histogram with grouped data.
	Median from Stem and Leaf Plot	Calculate the median from a stem and leaf plot. Easier = no repeated numbers, Medium and Harder = repeated numbers and a median that might not be a whole number.
	Mode from Stem and Leaf Plot	Find the mode in a stem and leaf plot.
	Stem and Leaf Plots with Range	Read the graph and answer true or false questions. Easier = is there a score of x?, Medium = how many scores between x and y?, Harder = is the range of the scores x?
	Histogram or Polygon?	Select the graph that represents a cumulative frequency histogram or polygon for a set of data.
	Dot Plots	Interpretation of dot plots. Questions ask for highest and lowest data values; number of data values; identification of outliers.
	Conversion Graphs	Quantities are changed to different units using conversion graphs, for example francs to dollars. Read the conversion graphs and answer questions.
	Data Analysis= Scatter Plots	For data presented in a scatter plot, students are required to either complete the table of values, find the mean of the y-values or the standard deviation of the y-values.
	Histograms for Grouped Data	Decide which frequency histogram correctly represents the given data (the frequency histograms are showing grouped data).
	Pie Charts	Interpret sector graphs. Sector values labelled with numerical value or percentage of whole. Some questions require finding a percentage of a quantity.

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New Zealand Statistic Level 5

AO	Activities Name	Description
S5-1	**Plan and conduct surveys and experiments using the statistical enquiry cycle: - determining appropriate variables and measures - considering sources of variation - gathering and cleaning data - using multiple displays, and re-categorising data to find patterns, variations, relationships, and trends in multivariate data sets - comparing sample distributions visually, using measures of centre, spread, and proportion presenting a report of findings**	
	Finding the Average	Easier= find the average between 2 or 3 numbers, Medium = up to 5 numbers, Harder = up to 7 numbers. Numbers are single digit or 2-digit numbers only.
	Mean	Calculate the mean from a list of up to 16 data values. All data values are 1- or 2-digit whole numbers. Answers are always whole numbers.
	Median	Determine the median of a list of up to 16 data values. Data values are not given in ascending order. List may include an even or odd number of data values. No data values are repeated. All answers are whole numbers
	Mode	Find the mode from a list of twelve 2-digit numbers.
	Mean from Frequency Table	Calculate the mean to one decimal place.
	Mode from Frequency Table	Find the mode from a basic frequency table.
	Median from Frequency Table	Find the median from a basic frequency table.
	Calculating Interquartile Range	Calculate the interquartile range of a group of numbers. Easier = 10 numbers, Medium = 12 numbers, Harder = 17 numbers.
	Cumulative Frequency Table	Enter missing values in the cumulative frequency table. Easier = 1 value missing, Medium = 2 values missing, Harder = 3 or 4 values missing.
	Median and Cumulative Frequency	Calculate the median from the cumulative frequency table.
	Box-and-Whisker Plots 2	Use information in a box plot to find the median, range, mean, interquartile ranges, first quartile, third quartile, maximum and mininum values.
	Box-and-Whisker Plots 1	Use information in a box plot to find the median, range, mean, interquartile ranges, first quartile, third quartile, maximum and mininum values. Support includes a glossary of the terms used.
	Understanding Box-and-Whisker Plots	Use information in a box plot to find the median, range, mean, interquartile ranges, first quartile, third quartile, maximum and mininum values. Support includes a glossary of the terms used.
	Scatter Plots	Select either 'no correlation', 'positive correlation' or 'negative correlation' to describe a given scatter plots. Knowledge of the strength of the relationship is not required.
	Creating a Sector Graph	Using the information provided work out the sector angles of the graph.
	Data Extremes and Range	Find the maximum and minimum values of a list of scores and determine the range.

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