Using Maths Aotearoa and Wilkie Way to deliver the refreshed New Zealand Curriculum

The Maths Aotearoa teacher book 4A continues the sequenced approach to developing key knowledge and concepts. It is organised into units of work each containing a number of chapters. This plan also shows the building blocks from books 3A & 3B that may be required for scaffolding for year 7 content for some of the students on starting Intermediate School. More practice material for each chapter is available through write on practice workbooks downloaded from the membership area of wilkieway.co.nz   All chapters are linked to Figure it Out activities.

Maths Aotearoa teacher books and student books are available from edify.co.nz

Phase 3: Year 7

Understand: (big ideas)	Do (practices)
As students build knowledge through their use of the mathematical and statistical processes, they begin to understand: • Patterns and variation • Logic and reasoning • Visualisation and application	Students will have learning opportunities to: • Investigate situations: • Represent situations: • Connect situations: • Generalise findings: • Explain and justify findings.

Know: Contexts Number & Algebra

Number Structure	Operations	Rational Numbers	Equations & relationships
Identify, read, write, compare and order whole numbers using the powers of 10 Find the highest common factor of 2 numbers under 100 and find the least common multiple of 2 numbers under 10. Use exponents to represent repeated multiplication, and identify square root of square numbers up to at least 100	Use rounding and estimation to predict results and to check reasonableness of calculations. Round whole numbers to any specified power of 10 and round decimals to the nearest tenth, hundredth or whole number. Recall multiplication facts to at least 10 x 10 and identify and describe the divisibility rules for 2, 3, 5, 9, and 10. Multiply whole numbers Divide whole numbers by 1 or 2 digit divisors. Use the order of operations. Order Compare, and locate integers on a number line, and explore adding and subtracting integers.	Identify, read, write and represent fractions, decimals (to 3 decimal places) and percentages. Compare, order, and convert between fractions, decimals (to 3 decimal places) and percentages. Multiply and divide numbers by 10, 100 & 1000 Find equivalent fractions, simplify fractions, and convert between improper fractions and mixed numbers. Multiply fractions and decimals by whole numbers. Find a percentage of a whole number, and find a whole amount given a simple fraction or percentage. Add & subtract fractions with different denominators (up to a tenthh) using equaivalent fractions Add & subtract decimals to 3 decimal places with an emphasis on estimating before calculating. Use proportional reasoning to explore multiplicative relationships between quantities.	Form and solve one step linear equations. Find the value of an expression or formula, given the values of variables. Describe and use the commutative, distributive and associative properties of operations. Identify the constant increase or decrease in a linear pattern, use variables and algebraic notation to represent the rule in an equation, and use the rule to make conjectures.
Financial Maths Calculate total cost and change for any amount of money Apply percentage discounts to whole dollar amounts.			**Algorithmic Thinking** Create, test, and revise algorithms involving a sequence of steps and decisions.

Maths Literacy Development
• Confidently understand and use mathematical specialist vocabulary - see voacabulary list in the curriculum document • Confidently read and understand math texts involving words, diagrams and symbols • Communicate and explain their mathematics using words, diagrams (graphs & tables), equations and expressions • Increase knowledge of mathematical symbols to include ratios, exponents, positive and negative integers, sigma, brackets, ordered pairs

Concepts being developed	Key knowledge being developed
• Addition and multiplication are commutative & associative • Subtraction & division are not commutative • Subtraction and addition are inverse relationships • Multiplication as an array, as an allocation or rate, as a multiplicative comparison • Division and multiplication are inverse relationships • Fractions as numbers between whole numbers • The importance of zero to the number system • Decimals as explicit fractions based on powers of ten	• Read and write whole numbers & decimals • Represent whole numbers and decimals using powers of 10 • Recall multiplication & division facts for up to 10 x 10 • Add and subtract decimal numbers reliably and efficiently • Multply fractions and decimals by whole numbers • Divide whole numbers reliably and efficently • Convert between fractions, decimals & percentages • Use order of operations in solving equations • Represent linear functions in tables, equations and graphs

Additional resources found in the members area of wilkieway.co.nz (subscription)

Numbers & The Number System - Phase Three Word problems to contextualise the number system Working with decimals **Addition & Subtraction - Phase Three** Word Problems Basic fact practice Game **Multiply & Divide - Phase Three** Games Word Problems Working with decimals	**Fractions, Decimals & Percentages - PhaseThree** Working with Decimals Add & subtract fractions Ratios, proportions & percentages Fractions ruler Word problems **Financial Maths- Phase Three** Money Workbooks

More learning experiences to add variety and challenge to your maths programme
• Graduated problems on a theme
• Maths Challenges
• Rich Learning Tasks

Maths Aotearoa Book 4A	Maths Aotearoa Book 3B	Maths Aotearoa Book 3A
Unit 1: Working With Whole Numbers	**Unit 2: Using the Number System for Addition and Subtraction**	**Unit 2: Using the Number System for Addition and Subtraction**
Chapter 1 Addition and Subtraction • Select an efficient method for solving addition and subtraction calculations • Make sensible estimates and use a calculator efficiently • Use and explain a standard written algorithm for addition and subtraction	**Chapter 5 Addition & Subtraction Strategies** • Reliably and efficiently add and subtract multi-digit whole numbers • Use a mental method when the numbers lend themselves to using a mental method (e.g =/- 199)	**Chapter 4 Addition** • Extend knowledge of addition strategies for 3 digit numbers • Use a standard written (vertical) form for addition of 3 digit numbers **Chapter 5 Subtraction** • Expand a standard partition and convert from canonical to non-canonical form • Use the non canonical form to understand the vertical algorithm for subtraction • Use a standard written (vertical) form for subtraction of 3 digit numbers
Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)		
Practice Workbooks 1. (Chapter 1) Addition & Subtraction	**Practice Workbooks** 11. (Chapter 5) Addition and Subtraction	**3A Practice Workbooks** 2. (Chapters 4 & 5) Addition & Subtraction
Chapter 2 Multiplication and Division • Use and apply array thinking to multiplication and division problems • Multiply multi digit numbers (using cross product thinking) • Use and explain a standard algorithm for multiplication & division	**Unit 3: Extending Multiplicative Thinking** **Chapter 6 Extending Multiplication** • Use expanded numerals and the distributive property of multiplication to multiply a multi digit number by a single digit • Use a standard written recording for multi digit multiplication **Chapter 7 Extending Division** • Read and interpret division questions in both recorded formats • Recognise division as the inverse of multiplication • Explore the division of larger numbers by a single digit **Chapter 8 Using Multiples and Factors** • Use terminology multiples and factors • Recognise multiples and the closest multiple • Identify factors of a given number • Use a standard written form for division of a multi digit number by a single digit number.	
Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)		
4A Practice Workbooks 2. (Chapter 2) Multipication & Division	**3B Practice Workbooks** 12. (Chapter 6) Extending Multiplication 13. (Chapters 7 & 8) Extending Division, Multiples and Factors	**Maths Gym** Learning the multipication & division facts

Maths Aotearoa Book 4A

Unit 1: Working With Whole Numbers

These two chapters introduce new ideas and mathematical literacy. It is essential that all students have the opportunity for these learning experiences. Some students will need more scaffolding than others.

Chapter 3 Positive and Negative Numbers
- Compare Integers
- Use + and - to mean a direction of movement
- Use and apply positive and negative integers

Chapter 4 Introducing Exponents
- Use the notation of powers to represent repeated multiplication
- Visualise square and cubic numbers

Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)

4A **Practice Workbooks** - under development

Maths Aotearoa Book 4A	Maths Aotearoa Book 3B
Unit 2: Working with Fractional Numbers	**Unit 3: Extending Multiplicative Thinking**
Chapter 5 Fractions, Decimals & Percentages • Identify a rule for finding a non unit fraction of a quantity • Use half as a bench mark to order and compare fractions • Add and subtract fractions • Convert between fractions, decimals and percentages • Solve problems involving fractions and percentages	**Chapter 9 Fractions** • Use correct fraction terminology *(denominator, numerator)* • Recognise patterns in fraction sequences • Recognise equivalent fractions • Understand ratio as comparing fraction parts of the whole
	Unit 4: Decimals and Percentages
	Chapter 10 Into the Hundredths • Read, write and represent a two place decimal number • Give the number one tenth or one hundredth more or less than a given number • Compare and order up to two place decimal number **Chapter 11 Into the Thousandths** • Read, write and represent a three place decimal number • Round a three place decimal to the closest whole number, tenth or hundredth • Use a standard written algorithm to add and subtract decimal numbers (aligning columns correctly) **Chapter 13 Introduction to Percentages** • Understand percentages as specific equivalent fractions • Know per cent means out of one hundred • Recall equivalent percentages for half, quarter and three quarters • Use equivalent fractions to convert a fraction to a percentage • Use fractions and division to find a percentage of a quantity

Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)

4A Practice Workbooks 3. (Chapter 5) Fractions Decimals and Percentages	**3B Practice Workbooks** 14. (Chapter 9) Fractions 15. (Chapters 10 & 11) Decimal Fractions

Maths Aotearoa Book 4A	Maths Aotearoa Book 3B
Unit 2: Working with Fractional Numbers	**Unit 4: Decimals and Percentages**
Chapter 6 Decimal Addition and Subtraction • Extend known additive strategies to decimal numbers • Extend known addition and subtraction algorithms to decimal numbes • Estimate solutions to decimal addition and subtraction calculations	**Chapter 12 Solving Problems with Decimals** • Use rounding to make an estimate • Use mental methods, standard written methods or estimation and a calculator to solve problems involving decimals
Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)	
4A Practice Workbooks 4. (Chapter 6) Decimal Addition and Subtraction	
Chapter 7 The Base 10 Number System • Multiply and divide a decimal number by 10 • Multiply and divide two digit numbers by decade numbers • Express larger numbers using exponents as powers of 10 **Chapter 8 Decimal Multiplication and Division** • Apply knowledge of the number system to make reasonable estimates and check the reasonableness of answers • Solve more complex problems involving decimal multipication and division	**Unit 2 Using the Number System for Addition and Subtraction** **Chapter 3 Larger Numbers** • Read, write, order and compare whole numbers into the millions • Give the number 10, 100, 1000 10 000 before and after any given whole number. • Give the number of tens or hundreds in a multi digit number • Understand the role of zero in writing large numbers in numerals **Chapter 4 Using Place Value** • Understand and use the repeated grouping of 10 in the number system (nesting) • Use zeros to represent repeated groupings in tens
Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)	
3A Practice Workbooks 5. (Chapter 7) Base 10 Number System	**3B Practice Workbooks** 10. (Chapter 3 & 4) Whole Number Place Value
Unit 3: Algebra: Understanding and Using Expressions and Equations	**Unit 5: Exploring Algebra**
Chapter 9 Order of Operations • Understand how the order of operations affects the value of an expression • Solve calculations using the order of operations • Determine the order of operations from the context of a problem • Create an expression for a multi-step problem using brackets when necessary **Chapter 10 Finding the Rule** • Identify a rule and represent the rule using mathematical symbols • Understand and use relationship symbols • Solve a simple linear equation using inverse operations	**Chapter 14 Using a Calculator** • Consolidate an understanding of equality • Focus on relationships between components of an equation Use a letter for a missing part of an equation **Chapter 15 Looking for Rules** • Identify rules for sequential patterns • Explain the rule for a specific pattern • Use a letter to represent an unknown number in a rule
Support Material available from Wilkie Way website wilkieway.co.nz: membership area (subscription)	
4A Practice Workbooks 6. (Chapters 9 & 10) Equations & Expressions	**3B Practice Workbooks** 16. (Chapters 14 & 15) Exploring Algebra

Maths Aotearoa Book 4A

Unit 3: Algebra: Understanding and Using Expressions and Equations

These two chapters introduce new ideas, mathematical literacy and mathematical tools. It is essential that all students have the opportunity for these learning experiences. Some students will need more scaffolding than others.

Chapter 11 Using Spreadsheets
- Create simple formulae
- Use a spreadsheet to perform simple calculations
- Use a spreadsheet as a problem solving tool
- Use symbol ∑ (sigma) from the tool bar to find the sum

Chapter 12 Graphing Rules and Patterns
- Describe relationships between numbers using mapping diagrams and ordered pairs
- Plot ordered pairs as co-ordinates on a grid (graph)
- Use tables and graphs to display and describe a linear relationship

Maths Aotearoa teacher books provide the guidance on how to deliver the content found in the student textbooks.
- **Information to develop and clarify your own conceptual understanding of the mathematics your students are learning.**
- **Making connections with previous work**
- **What manipulatives you could use**
- **Specific explanations required**

The teacher book is deliberately NOT SCRIPTED as I firmly believe the questions you ask should be led the responses your students give you. The questions you ask are dependent on your understanding of the mathematics. As you better understand then the better your questioning will become.

By this level students should have a sound foundational knowledge of mathematics and need to be given plenty of opportunities to use their mathematics in unfamiliar problem solving situations. This will provide opportunities for students to challenge their own thinking about conceptual ideas and learn to explain and justify their thinking. Remember it is making mistakes that create the best learning. Each chapter is linked to Figure it Out activites. (Learning to read the texts is part of the mathematical literacy learning and students may need support.)