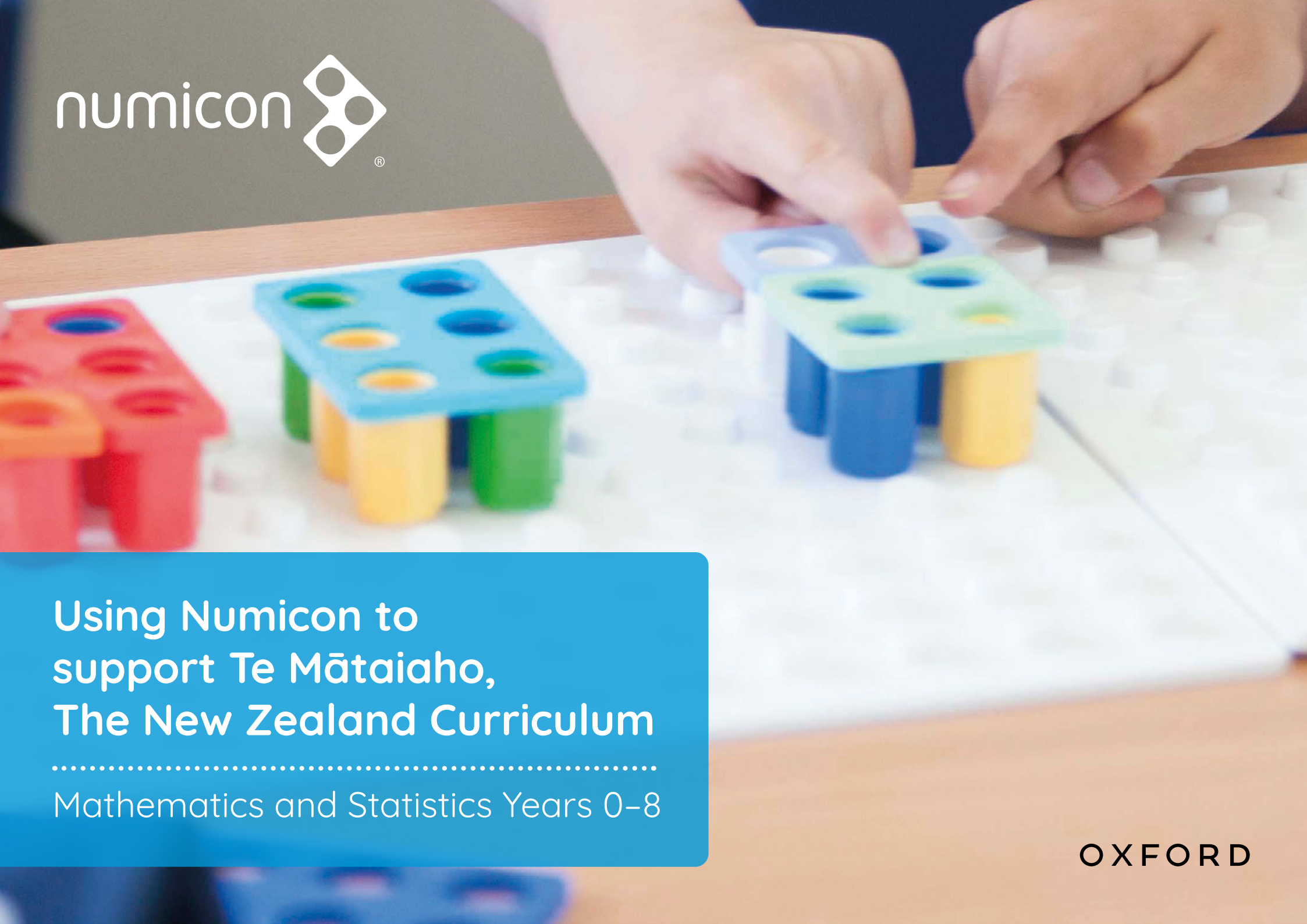

numicon®

Using Numicon to support Te Mātaiaho, The New Zealand Curriculum

Mathematics and Statistics Years 0–8

OXFORD

Using Numicon to support Mathematics and Statistics Years 0-8

Numicon is a proven approach to teaching and learning designed to give children the understanding of mathematical ideas and relationships that is essential for successful reasoning and problem-solving. The use of apparatus builds children's mental image of abstract concepts, and helps to develop their understanding of the connections between different areas of mathematics. The resources cover the key mathematical ideas for processes in mathematics: Number, Algebra, Measurement, Geometry, Statistics and Probability that are essential foundations for further mathematical thinking.

We have correlated focus activities from Numicon's Number, Pattern and Calculating, Geometry, Measurement and Statistics, and a dedicated Statistics and Probability Booklet (coming soon) to the New Zealand Curriculum to support teachers in their planning. These correlations will be useful whether schools choose to follow the focus activities in the order outlined in the Numicon Planning documents (which we would recommend), or prefer to dip in and out of the teaching materials for different topics.

Where the document states 'Activity to follow', we will be adding dedicated new activities to ensure full coverage of the curriculum, at which point this document will be updated.

The Numicon Approach fulfils the curriculum for students in a knowledge-rich environment where the concepts are taught alongside the processes of being a mathematician. Where you see references to processes, these are embedded in the learning experiences every week, and include:

- The use of representations to communicate with self and others
- Connections within maths and the daily lives of the students
- Investigations
- Generalising
- Explaining and justifying

Included in the Numicon programme is the strong connection with the language of maths. Every week teachers are provided with a list of words and terms to use in their teaching through meaning and usage. There is an expectation that these words are used by the teachers, displayed on walls, etc. Students are also encouraged to use these words and terms with confidence.

Numicon teaching materials featured in this correlation:

Firm Foundations

Number, Pattern and Calculating 1–6

Geometry, Measurement and Statistics 1–6

Statistics and Probability Booklet 1–6

Key:

Firm Foundations

FF: Firm Foundations; **ADMT**: All doing maths together with Numicon; **MGP**: Maths games and puzzles; **CNIB**: Counting and number ideas book; **SSR**: Stories, songs and rhymes; **HFA**: Healthy food activity; **SNFSR**: Stories, non-fiction, songs and rhymes; **OMPP**: Outdoor maths and physical play; **EAD**: Expressive arts and design; **SWMP**: Sand, water and messy play; **UW**: Understanding the world.

Numicon 1–6

NPC: Number, Pattern & Calculating; **NNS**: Numbers & Number System; **Calc**: Calcuating; **P&A**: Pattern & Algebra; **GMS**: Geometry & Measures; **Geo**: Geometry; **Mea**: Measures; **SF**: Securing Foundations; **GS**: Getting Started; **PFT**: Preparing for formal testing; **Inv**: Investigations.

Contents:

Note: We recommend that you follow the progression of the Numicon programme, from Firm Foundations through to Numicon 6. Please see the Numicon Planning Documents on Numicon Online NZ for details.

Phase 1

Number

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Number structure	subitise (recognise without counting) the number of objects in a collection of up to 5 FF **Everyday counting, pages 74–76:** **7 ADMT, 7.1, 7.2, MGP, SNFSR, SWMP, OMPP**	subitise (recognise without counting) the number of objects in a collection of up to 10, including by combining two patterns of 1–5 objects FF **Everyday counting, pages 74–76:** **7 ADMT, 7.1, 7.2, MGP, SNFSR, SWMP, OMPP** **NPC 1 SF 1, 2, 3, 4, 5**	group objects in a collection of at least 10, subitise the number of objects in each part, and find the total number in the collection using the parts **NPC1 SF 2 GS 5** **NPC1 SF 3 NNS 1, 2** **NPC1 SF 7 NNS 2** **NPC1 SF 11 NNS 1** **NPC1 NNS 2** **NPC1 NNS 4.7**	estimate the number of objects in a collection of less than 100, using patterns and groupings **NPC2 GS 3** **NPC2 NNS 1, 3 (Prac & Dis PW 2) 4.2 (Prac & Dis PW 2), 5.2, 5.3,**	Use a range of materials and images that **represent** structured and unstructured patterns and collections (e.g., dot patterns, 10s frames, dice, materials that can be grouped in 10 such as ice-block sticks). Also use language that quantifies and compares pattern arrangements (e.g. more, less, the same, different, combine, separate). **Connect** subitising to partitioning collections of objects (e.g., 6 and 2 on two dice are the same as 5 and 3 on two 10s frames).
	count forwards or backwards from any whole number between 1 and 10, and then between 1 and 20 FF **Daily routines, pages 35–38** FF **Everyday counting:** **1 ADMT, SNFSR, pages 50–51** **2 ADMT, page 54** **4 ADMT, page 62** **7 HFA, page 75** **10 OMPP, page 88** **11 OMPP, page 92** **15 OMPP, page 108** **16 SNFSR, SWMP, OMPP, pages 111–12** **18 ADMT, 18.5, page 118**	count forwards or backwards in 1s, 2s, and 10s from any whole number between 1 and 20, and then between 1 and 100 FF **Daily routines, pages 35–38** FF **Everyday counting:** **1 ADMT, SNFSR, pages 50–51** **2 ADMT, page 54** **4 ADMT, page 62** **7 HFA, page 75** **10 OMPP, page 88** **11 OMPP, page 92** **15 OMPP, page 108** **16 SNFSR, SWMP, OMPP, pages 111–12** **18 ADMT, 18.5, page 118** **NPC1 SF 1 NNS 2 + whole-class suggestions** **NPC 1 NNS 3**	count forwards or backwards in 1s, 2s, 5s, and 10s from any whole number between 1 and 100 **NPC1 SF 1, SF9** **NPC1 NNS 2** **NPC1 Calc 2** **NPC1 NNS 2 + whole class suggestions, 3** **NPC 2 NNS 1.1, 1.2, 1.3, 1.4, 1.5**	count forwards or backwards in 2s, 3s, 5s, and 10s from any whole number between 1 and 1,000 **NPC2 NNS 1 2.6** **NPC2 P&A 1.7, 5** **GMS2 Mea 2.1**	Use a range of materials (e.g., number lines, 100s boards, number flip charts, 1,000s books, a Slavonic abacus, ice-block stick bundles). In general, support students to practise counting (e.g., in 2s and 5s) in short sequences (e.g., at year 3, "Count in 1s from 895 to 904; count in 2s from 90 to 110"). **Investigate** short patterns in multiples of 2s, 3s, 5s, and 10s, using rhymes, songs, choral counting, the grouping of discrete objects, the recording of patterns, and picture books. Have students practise finding 1, 10, or 100 more or less for a given number. Use materials to support students to identify numbers and patterns (e.g., 100s boards, 1,000s books). **Connect** to te reo Māori to support place-value (PV) understanding (e.g., tekau mā tahi (10 and 1), toru tekau mā rua (30 and 2). **Activity to follow**

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Number Structure	identify, read, and write whole numbers up to at least 10 **FF Daily routines, pages 35–38** **FF Everyday counting:** **2 ADMT, CNIB, pages 54–55** **4.3, page 62** **5.1, 5.2, 5 MGP, pages 66–67** **9 OMPP, page 84** **11 MGP, CNIB, pages 90–91** **15.2, page 106** **16 SWMP, page 112**	identify, read, and write whole numbers up to at least 20, and represent them using the ten-and-ones structure of teen (11-19) and -ty (multiples of 10) numbers (e.g., 17 = 10 + 7, 20 = 2 10) **35–38** **FF Everyday counting:** **2 ADMT, CNIB, pages 54–55** **4.3, page 62** **5.1, 5.2, 5 MGP, pages 66–67** **6 ADMT, page 70** **9 OMPP, page 84** **11 MGP, CNIB, pages 90–91** **15.2, page 106** **16 SWMP, page 112** **18 ADMT, 18.4, SWMP, pages 118–19** **NPC1 SF 6** **NPC1 NNS 1, 2, 3**	identify, read, and write whole numbers up to at least 100, and represent them using base 10 structure **NPC1 NNS 4** **NPC2 NNS 1.6** **NPC2 NNS 2, 3,**	identify, read, and write whole numbers up to at least 1,000, and represent them using base 10 structure **NPC2 NNS 1, 2, 3, 4** **NPC2 Calc 6.1, 6.2** **NPC3 NNS 1.3, 1.4, 2.2, 2.3, 2.4, 2.5, 3.3, 3.4, 3.5**	Have students practise saying, reading, and writing any given number within an identified number range. Use materials to support this (e.g., number flip boards, PV flip charts and houses). **Explain** that base 10 structure is based on groups of ten (ten ones form one ten, ten tens form one hundred, ten hundreds form one thousand etc.) and that both the position and value of a digit indicate the quantity it represents (e.g., 64 has 6 tens and 4 ones, 60 + 4 = 64). Have students **investigate** and **represent** the base 10 structure of numbers using a range of materials and digital tools (e.g., 100s boards, PV houses, PV blocks, ice-block sticks, arrow cards, number fans, words, numerals). **Investigate** odd and even numbers and the patterns they notice. **Connect** numerals, representations of them, and language (e.g., 652 represented with PV money: “652 = 600 + 50 + 2, 6 hundreds + 5 tens + 2 ones, six hundred and fifty two”).

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Number structure	compare and order whole numbers up to at least 10 and ordinal numbers (e.g., 1st, 2nd, 3rd), using words FF **Everyday counting:** **1.2, 1.7, pages 50–51** **2 ADMT 2.1–2.5, MGP, OMPP, pages 54–56** **3.3, 3 MGP, pages 58–59** **4 ADMT, 4.3, OMPP, pages 62–63** **5.1, 5 HFA, pages 66–67** **6 HFA, page 71** **9 ADMT, SWMP, OMPP, pages 82 and 84** **10.5, 10 MGP, pages 86–87** **14 ADMT, MGP, SNFSR, pages 102–3** **17 SWMP, page 115** **18.6, 18 OMPP, pages 119–20**	compare and order whole numbers up to at least 20 and ordinal numbers (e.g., 1st, 2nd, 3rd), using words or numerals and suffixes FF **Everyday counting:** **1.2, 1.7, pages 50–51** **2 ADMT 2.1 – 2.5, MGP, OMPP, pages 54–56** **3.3, 3 MGP, pages 58–59** **4 ADMT, 4.3, OMPP, pages 62–63** **5.1, 5 HFA, pages 66–67** **6 HFA, page 71** **9 ADMT, SWMP, OMPP, pages 82 and 84** **10.5, 10 MGP, pages 86–87** **14 ADMT, MGP, SNFSR, pages 102–3** **17 SWMP, page 115** **18.6, 18 OMPP, pages 119–20** **NPC1** SF 4, 5, 6, 7 **NPC1** NNS 1, 4 **NPC2** NNS 2.7, 4.1	compare and order whole numbers up to at least 100 **NPC1** NNS 4 **NPC 2** NNS 3, 4	compare and order whole numbers up to at least 1,000 **NPC2** NNS 4 **NPC2** Calc 4.13 **NPC 3** NNS 2, 3 **NPC3** NNS 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11 **NPC4** NNS 1, 2	Show the sequencing of numbers using a number line (select-numbered, marked, or empty). Change the number-line orientation from horizontal to vertical if students need support with the concepts of before and after. **Explain** and use the language of comparison when demonstrating why one number is larger or smaller than another (e.g., "63 is larger than 36, as 6 tens is larger than 3 tens"). Show how the position of digits in the PV structure helps us to order and compare two- and three-digit numbers.

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
	partition up to 5 objects, and then up to 10 objects, using a systematic approach and noticing patterns FF **Everyday counting:** **18 CNIB, page 119** **NPC1** P&A 1.7 **NPC1** Calc 3.2, 3.3, 3.4, 3.5 **Activity to follow**	partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns FF **Everyday counting:** **18 CNIB, page 119** **NPC1** SF 7 NNS 1, 2 **NPC1** NNS 2.1, 2.2 **NPC1** Calc 8.9, 8.11, 8.13, 9.1, 9.2, 9.8 **Activity to follow**	partition and regroup whole numbers up to at least 100, using a systematic approach and noticing patterns (e.g., 10 + __ = 70, 20 + __ = 70, 30 + __ = 70) **NPC 1** Calc 9.7, 9.8, 9.9, 9.10 **NPC2** Calc 1.6, 6.1, 6.2, 6.3, 6.4	partition and regroup whole numbers up to at least 1,000, using a systematic approach and noticing patterns (e.g., 400 + 300 = ___, 350 + ___ = 500) **NPC2 Calc** 6.1, 6.2, 6.3, 6.4 **NPC3** NNS 5 **NPC4** NNS 1	**Investigate** and **represent** the partitioning of numbers using appropriate materials for the year level – for example: multilink cubes, bead strings, 10s frames, and counters, at 6 months and year 1 a Slavonic abacus, ice-block sticks, and PV money, at year 2 PV money and PV blocks, at year 3. **Connect** students' subitising with pattern understanding (at 6 months and year 1) and known groupings and facts (at years 2–3). **Explain** and discuss how to systematically record the partitioning of numbers (e.g., using partitioning diagrams, tables, vertically-listed equations).
Operations		use estimation to predict results and to check the reasonableness of calculations **Activity to follow**	use estimation to predict results and to check the reasonableness of calculations **Activity to follow**	use estimation to predict results and to check the reasonableness of calculations **Activity to follow**	**Explain** and spend time developing the concepts of: • estimation, using the language of 'about', 'more or less', and 'close to' • rounding, using 100s boards and number lines marked with the multiples of 10 or 100, progressing to unmarked number lines at year 3. Have students **investigate** and **connect** practical estimation situations that involve quantities and measures (e.g., the number of balls in a box, the number of steps to the door, the length of a piece of string).
			identify the nearest ten to any whole number up to 100 **NPC2** NNS 5	round whole numbers up to 1,000 to the nearest hundred or ten **NPC2** NNS 5 **NPC3** NNS 6	

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Operations	join and separate groups of up to a total of 10 objects by grouping and counting FF **Everyday counting:** **7 ADMT, 7.1–7.4, MGP, CNIB, RPSWC, SWMP, OMPP, pages 74–76** **8 ADMT, 8.1–8.3, MGP, CNIB, SWMP, OMPP, pages 78–80** **9 ADMT, 9.1–9.4, MGP, CNIB, SWMP, OMPP** **10 ADMT, 10.1–10.5, MGP, CNIB, OMPP, pages 86–88** **12 ADMT, 12.1–12.6, MGP, CNIB, HFA, RPSWC, pages 94–96** **14 ADMT, 14.1–14.5, MGP, CNIB, RPSWC, SWMP, OMPP, pages 102–4** **15 ADMT, 15.1–15.5, MGP, CNIB, SWMP, OMPP, pages 106–8** **16 ADMT, 16.1–16.4, MGP, CNIB, HFA, SWMP, OMPP, pages 110–12** **17 ADMT, 17.1–17.5, MGP, CNIB, SWMP, OMPP, pages 114–16** **18 ADMT, 18.1–18.3, CNIB, RPSWC, pages 118–19**	join and separate groups of up to a total of 20 objects and find the difference between groups by grouping and counting (e.g., 9 + 6, 7 + _ = 11) FF **Everyday counting:** **7 ADMT, 7.1–7.4, MGP, CNIB, RPSWC, SWMP, OMPP, pages 74–76** **8 ADMT, 8.1–8.3, MGP, CNIB, SWMP, OMPP, pages 78–80** **9 ADMT, 9.1–9.4, MGP, CNIB, SWMP, OMPP, pages 82–84** **10 ADMT, 10.1–10.5, MGP, CNIB, OMPP, pages 86–88** **12 ADMT, 12.1–12.6, MGP, CNIB, HFA, RPSWC, pages 94–96** **14 ADMT, 14.1–14.5, MGP, CNIB, RPSWC, SWMP, OMPP, pages 102–4** **15 ADMT, 15.1–15.5, MGP, CNIB, SWMP, OMPP, pages 106–8** **16 ADMT, 16.1–16.4, MGP, CNIB, HFA, SWMP, OMPP, pages 110–12** **17 ADMT, 17.1–17.5, MGP, CNIB, SWMP, OMPP, pages 114–16** **18 ADMT, 18.1– 8.3, CNIB, RPSWC, pages 118–19** **NPC1** SF 4, 5, 6, 7, 8, 9, 11 **NPC1** Calc 2, 4, 6, 7, 8, 9 **NPC1** P&A 1 **NPC2 P&A 2** **NPC2** Calc 1, 2, 3, 4, 5, 6, 7, 10, 11, 14	add and subtract numbers up to 100 without renaming (e.g., 53 + 21, 55–32) **NPC2** Calc 4, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 13	add and subtract two-digit numbers (e.g., 43 – 28, 37 + 18) **NPC2** Calc 4, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 13	**Explain** and discuss addition and subtraction using **representations**, including: • discrete materials (counters, blocks, context items), 10s frames, and number lines (at 6 months and year 1) • bundles of sticks, number disks, and number lines (at year 2) • PV materials (PV money, blocks, and discs) and number lines (at year 3). **Connect** symbols and equations with problems, using correct vocabulary (e.g., 'add', 'join', and 'plus' for addition). Have students practise decoding and solving word problems. At year 3, **explain and connect** horizontal equations and the vertical-column method for addition and subtraction. Demonstrate making estimates or mental calculations by **connecting** to place value, partitioning, and known facts. Use a range of problem types (e.g., result, change, start-unknown). Use worked examples and think-alouds to **explain** the most efficient approaches when solving problems. Have students **investigate** and **generalise** adding 0 to or subtracting 0 from a number (at year 1) and applying the commutative property of addition (e.g., 5 + 4 = 4 + 5).

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Operations		explore addition facts up to 10 and their corresponding subtraction facts (families of facts), including doubles and halves FF **Everyday counting:** **7 ADMT, 7.1–7.4, page 74** **8 HFA, RPSWC, page 79** **9.4, page 82** **10.2–10.3, page 86** **11.1–11.6, 11 MGP, SWMP, pages 90–92** **13 CNIB, HFA, RSC, SWMP, EAD, pages 99–100** **14 CNIB, page 103** **15 ADMT, 15.2, 15.5, MGP, CNIB, pages 106–8** **16 ADMT, 16.1 16.4, MGP, CNIB, SNFSR, HFA, SWMP, pages 110–12** **17 ADMT, 17.1–17.5, MGP, CNIB, pages 114–15** **18.1–18.3, 18 CNIB, RPSWC, pages 118–19** **NPC1** Calc 1, 2, 4, 6, 7	recall addition facts up to 10, and explore addition facts up to 20 and their corresponding subtraction facts (families of facts), including doubles and halves **NPC1** Calc 5.5 **NPC1** Calc 7 **NPC2** Calc 1, 2	recall addition facts up to 20 and their corresponding subtraction facts (families of facts), including doubles and halves **NPC 2** P&A 4 **NPC2** Calc 10, 14 **NPC1** Calc 5.5	Use materials to **investigate** addition and subtraction facts (e.g., counters, 10s frames, an abacus, multilink cubes), and use part-whole diagrams to develop subtraction facts and **connect** to addition facts. **Explain** how to record equations and families of facts, **connecting** with the language for each operation. Provide a range of tasks to consolidate learning and develop fluency (e.g., physical and digital games, using families of facts and, at year 3, table grids).
			identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s **NPC2** P&A 5.1, 5.2, 5.3, 5.4, 5.7, 5.12	recall multiplication and corresponding division facts for 2s, 3s, 5s, and 10s **NPC2** P&A 5 **NPC2** Calc 8, 9, 15 **NPC3** Calc 7.3, 7.5 **+ whole class** **NPC3** Calc 10,	Use a range of materials to **represent** skip counting and multiplication and division facts (e.g.,100s boards, choral counting, games, number lines, a Slavonic abacus, families of facts, and, at year 3, table grids). Provide a range of tasks to consolidate learning and develop fluency.

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Operations		multiply and divide using equal grouping or counting FF **Daily routines, pages 35–38** FF **Everyday counting:** **7 HFA, page 74** **10 HFA, RPSWC, pages 87–88** **11 ADMT, 11.1– 11.6, MGP, CNIB, HFA, SWMP, OMPP, pages 90–92** **12 CNIB, page 95** **13 ADMT, 13.1–13.4, MGP, OMPP, pages 98–100** **14 CNIB, page 103** **16 OMPP, page 112**	multiply and divide using equal grouping or skip counting (e.g., in 2s, 5s, and 10s) **NPC2** P&A 5 **NPC2** Calc 8, 9, 15 **NPC3 Calc** 5, 7, 10	multiply a one- or two-digit number by a one-digit number, using skip counting or known facts (e.g., 4 6, 2 23) **NPC2 Calc** 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 9 **NPC3 Calc** 5, 7, 10	**Represent** multiplication and division problems using discrete materials, pictures, diagrams, symbols, number lines, words, equations, digital tools, and, at year 3, arrays, PV materials, and bar models. Use correct mathematical language when discussing multiplication and division (e.g., multiply, groups of, sets of, rows of, equal groups, divide, share equally). Have students practise decoding and solving word problems. **Connect** with subitising and addition and subtraction concepts when demonstrating solving multiplication and division problems. **Explain** and **represent** division as a sharing problem (e.g., "Share 12 marbles equally among 3 friends") or a grouping problem (e.g., "You have 12 marbles. How many groups of 3 marbles can you make?").
				divide whole numbers by a one-digit divisor with no remainders, using grouping (e.g., 24 ÷ 3, 32 ÷ 4) **NPC2** Calc 15 **NPC3 Calc** 7.1, 7.2, 7.3, 7.4, 7.5	Use worked examples and think-alouds to **explain** the most efficient approaches when solving multiplication and division problems. **Investigate** and **generalise** multiplying a number by 0 or 1, dividing a number by 1, dividing a number by itself, and why we cannot divide by 0 (e.g., by trying to solve 0 x __ = 5). At year 3, **explain** and use the multiplicative identity (e.g., 5 × 1 = 5, 4 ÷ 1 = 4) and commutative property (e.g., 3 x 4 = 4 x 3). Demonstrate making estimates or mental calculations by **connecting** to place value, partitioning, and known facts.

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Rational numbers		identify and represent halves and quarters as fractions of sets and regions, using equal parts of the whole FF **Daily routines, Snack time, page 37** FF **Everyday counting:** **3 EAD, page 60** **11.4, 11 SSR, SHFA, WMP, EAD, OMPP, pages 90–92** **12 CNIB, page 95** **13 ADMT, MGP, CNIB, HFA, RPSWC, SWMP, EAD, OMPP, pages 90–100** **16 HFA, page 111** **NPC1** Calc 5	identify, read, write (using symbols and words), and represent halves, quarters, and eighths as fractions of sets and regions, using equal parts of the whole **NPC1** Calc 5 **NPC1** Calc 8.11 **NPC2** Calc 16 **NPC3** NNS 7.7	identify, read, write, and represent halves, thirds, quarters, fifths, sixths, and eighths as fractions of sets and regions, using equal parts of the whole and by positioning on a number line **NPC2** NNS 6 **NPC2** Calc 16 **NPC 3** NNS 7.1, 7.2, 7.3, 7.5, 8.2, 8.3.	**Represent** fractions using a range of materials – continuous (bar models, number lines), discrete (sets of objects), and digital. **Explain** and reinforce that when fractions are represented symbolically: • the denominator is the bottom number and shows how many pieces a whole has been equally split into • the numerator is the top number and shows how many of those parts the fraction represents. Have students practise saying, reading, and writing fractions in words and symbols. **Explain** how to fold paper strips to create fractions of one whole. Label the parts using words and symbols, and use them to create a fraction wall for comparing and ordering fractions. **Explain** that a fraction is a number that can be placed on a number line.
			directly compare two fractions involving halves, quarters, and eighths **NPC2** NNS 6 **NPC2** Calc 16.1, 16.2, 16.3, 16.4, 16.6 **NPC3** NNS 7.7	compare and order fractions involving halves, quarters, and eighths and identify when two fractions are equivalent **NPC2** NNS 6 **NPC3 NNS** 7.2, 7.3, 7.5, 7.7	

Number continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Rational numbers		find a half or quarter of a set using equal sharing and grouping. FF **Everyday counting:** **7 HFA, page 75** **11 ADMT, 11.5, HFA, pages 90–91** **13 ADMT, OMPP, pages 98 and 100** **16 CNIB, SWMP, pages 111–12** **Dividing by grouping:** **NPC1** NNS 2, **NPC2** Calc 15 **Activity to follow** **NPC1** Calc 5.5 **NPC2 Calc** 16.3, 16.4, 16.6	find a half and quarter of a set by identifying groups and patterns (rather than sharing by ones), and identify the whole set or shape when given a half or quarter **NPC1** Calc 5, 8.11 **NPC2 Calc** 16.3, 16.4, 16.6 **NPC3** NNS 8.6 **NPC3** Calc 16 **Activity to follow**	find a unit fraction of a whole number (e.g., of 15), and identify the whole set or amount when given a unit fraction (e.g., " of the set is 3, what is the whole set?") **NPC3** NNS 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.8, **Activity to follow**	**Investigate** a range of practical situations using a range of **representations**, including materials, drawings and diagrams, and digital tools (e.g., discrete objects, bar models, paper strips for partitioning). Make **connections** between: • symbols, words, and pictures • counting, subitising patterns and known groupings, and skip counting to solve problems (at years 1–2) • skip counting and using known addition and multiplication facts to solve problems (at year 3). Use mathematical language to develop an understanding of fractions (e.g., numerator, denominator, shared equally, divide, partition, equal parts).
				add and subtract unit fractions with the same denominator (e.g., $\frac{1}{8} + \frac{1}{8} + \frac{3}{8} = \frac{3}{8}$) **NPC3** NNS 8.5	**Investigate** adding and subtracting fractions within familiar contexts (e.g., cutting apples into eighths or partitioning paper strips into six equal parts, and then **representing** addition and subtraction with these materials). **Connect representations**, including symbols and equations, to drawings and materials (e.g., fraction walls, paper fraction strips), and show them on a number line.
Financial mathematics			recognise and order New Zealand denominations up to $20 according to their value, make groups of 'like' denominations, and calculate their value **GMS1** Mea 2 **NPC1** NNS 3.1, 3.2 **NPC1** Calc 3, 6.8, 8.3 **NPC2** P&A 7.5 **GMS2** Mea 2.1, 2.5, 2.6, 3.1, 3.2, 3.3	make amounts of money using one- and two-dollar coins and 5-, 10-, 20-, 50-, and 100-dollar notes. **NPC2** P&A 7.5 **GMS2** Mea 2, 3	Have students use play money (coins and notes) to **represent** practical financial situations. At year 2, compare only notes with notes or cents with cents, not a mixture of them. At year 2, **investigate** appropriate financial situations that involve both saving and spending. **Connect** to place value, addition and subtraction, and skip counting when calculating amounts.

Algebra

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Equations and relationships		solve true or false number sentences and open number sentences involving addition and subtraction of one-digit numbers, using an understanding of the equal sign (e.g., 2 + 5 = 3 + __ , 7 – 5 = 6 – 4 (T or F?) **NPC1** P&A 1.7, 1.8 **NPC1** Calc 3.7, 8.2 **Activity to follow**	solve true or false number sentences and open number sentences involving addition and subtraction of one- and two-digit numbers, using an understanding of the equal sign (e.g., 18 + __ = 17 + 6, 17 = 25 (T or F?) **NPC1 Calc 4, 7** **NPC1** P&A 1.7, 1.8 **NPC1** NNS 4.3 **NPC1** Calc 3.7, 8.2, 8.11, 8.13 **NPC2** Calc 14 **Activity to follow**	solve true or false number sentences and open number sentences involving addition and subtraction, using an understanding of the equal sign **NPC2** P&A 2, 3, 7.1, 7.2, 7.3 **NPC2** Calc 1.1, 4.8, 4.13, 5.9, 9.7, 9.8, 9.9, 13.4, 13.7, 14.2, 14.4, 14.8 **Activity to follow**	**Represent** the equal sign as the 'same as' to demonstrate it is a symbol of equivalence. **Investigate** number sentences using **representations** such as: • 10s frames and discrete materials (at years 1–2) • word problems with comparisons (at year 3). At years 2–3, solve number sentences that have numbers beyond what students are using in operations, so that the emphasis is on the equal relationship, not operating.
Equations and relationships	copy, continue, create, and describe a repeating pattern with two elements. FF **Everyday counting:** **1 OMPP, page 52** **2.6, 2 MGP, RPSWC, EAD, pages 56–57** **3 ADMT, OMPP, pages 58 and 60** **4 ADMT, MGP, RPSWC, EAD, pages 63–64** **5 SNFSR, EAD, pages 67–68** **6 MGP, SWMP, EAD, OMPP, pages 71–72** **7 EAD, page 76** **8 MGP, EAD, pages 78 and 80** **10 MGP, SWMP, OMPP, pages 87–88** **13 EAD, page 100** **17 HFA, page 115** **18 ADMT, MGP, EAD, page 118–20**	copy, continue, create, and describe a repeating pattern with three elements, and identify missing elements in a pattern FF **Everyday counting:1 OMPP, page 52** **2.6, 2 MGP, RPSWC, EAD, pages 56–57** **3 ADMT, OMPP, pages 58 and 60** **4 ADMT, MGP, RPSWC, EAD, pages 63–64** **5 SNFSR, EAD, pages 67–68** **6 MGP, SWMP, EAD, OMPP, pages 71–72** **7 EAD, page 76** **8 MGP, EAD, pages 78 and 80** **10 MGP, SWMP, OMPP, pages 87–88** **13 EAD, page 100** **17 HFA, page 115** **18 ADMT, MGP, EAD, page 118–20**	recognise and describe the unit of repeat in a repeating pattern, and use it to predict further elements using the ordinal position **NPC1** SF 2, P&A 3 **NPC1** SF 4, P&A 1, 2 **NPC1** SF P&A 1 **NPC1** SF 7, P&A 1, 2 **NPC1** SF 8, P&A 1, 2 **GMS1** Geo 2.5	recognise, continue, and create repeating and growing patterns, and describe a rule to explain a pattern **NPC2** GS 5, 7, 9, 10 **NPC2** P&A 1.5, 1.6, 1.7, 5.11 **NPC2** Calc 8.7	**Investigate** repeating and growing patterns in a range of contexts (e.g., cultural patterns, patterns in the local environment and on everyday objects). Use materials, sound, movement, and digital tools to **represent** and continue repeating and growing patterns. At years 2–3, demonstrate recording the pattern in a table. Form **generalisations** when students notice that repeating patterns constructed in different ways are similar (e.g., 'red, blue, red, blue' and 'hop, jump, hop, jump' are ABAB patterns). Help students to notice the similarities and differences between patterns by recording them. With students at year 2, **generalise** by using the unit of repeat and ordinal position to identify further elements in a pattern. Use mathematical language and sentence starters to support students to **explain** and **justify** how a pattern is repeating or growing and to predict further terms.

Algebra continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Algorithmic thinking		follow step-by-step instructions to complete a simple task. FF **Daily routines, pages 35–38** FF **Everyday counting:** **1 RPSWC, EAD, pages 51–42** **2 MGP, page 55** **4 RPSWC, OMPP , pages 63–64** **6 SWMP, page 72** **7 OMPP, page 76** **8 OMPP, page 80** **9 ADMT, MGP, SWMP, pages 82–84** **10 ADMT, page 86** **17 OMPP, page 116**	follow and give step-by-step instructions for a simple task, identifying and correcting errors as the instructions are followed. **NPC1** SF3, NNS 3 **NPC1** SF4, NNS 4 **NPC1** SF 8, P&A 3, 4 **NPC1** SF 9, P&A 1, 2, 3, 4 **NPC1** SF10, P&A 1 **NPC1** SF12, P&A 1 **NPC** P&A 4 **GMS1** Geo 5.2, 5.4, 5.6, 5.7	create and use a set of precise, step-by-step instructions for carrying out a familiar routine or task. **NPC 2** P&A 1	**Represent** step-by-step instructions using drawings, words, flow diagrams, and verbal instructions that form a sequence**.** With students, **investigate** sorting unfamiliar and familiar objects according to a set of instructions, directing a person or object (e.g., through an obstacle course or maze), and following and creating a set of pictorial instructions. **Explain**, **justify**, and show how a set of instructions is complete or incomplete, using think-alouds and prompts. **Connect** a series of events from a story, narrative, or a daily timetable with statements in Number, Algebra, Measurement, and Geometry.

Measurement

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Measuring			estimate and use an informal unit repeatedly to measure the length, mass (weight), volume, or capacity of an object **GMS1** Mea 1.3, 4.4, 5.3	estimate and then reliably measure length, capacity, and mass (weight) using whole-number metric units (e.g., from tools with labelled markings) **GMS2** Mea 1, 4, 5, 6	**Explain** estimation, using the language of 'about', 'more or less', and 'close to' to help students reflect on what the quantity or measure might be. **Investigate** practical estimating and measuring situations, using appropriate measuring tools (e.g., at year 2, balance scales, capacity containers, informal units; at year 3, rulers, measuring jugs and cups, scales) At year 3, **explain** how to construct and use measurement devices, particularly rulers, measurement containers, and balance scales. Demonstrate how to accurately measure length in centimetres, mass (weight) in grams, and capacity in millilitres (at year 3).

Measurement continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Measuring	directly compare two objects by an attribute (e.g., length, mass (weight), capacity) FF **Everyday counting:** **1.5, 1.6, page 51** **1 SNFSR, RPSWC, SWMP, OMPP, pages 51–52** **2 OMPP, page 56** **3.5 page 59** **4 SWMP, RPSWC, page 64** **6 SSR, RPSWC, SWMP, EAD, OMPP, pages 71–72** **7 ADMT, MGP, SNFSR, RPSMC, pages 74–75** **8.4 page 78** **9.3, 9.4 page 82** **11 SWMP, page 92** **12 SWMP, page 96** **15.5 SNFSR, page 107** **16 HFA, page 111** **17 MGP, RPSWC, OMPP, pages 115–16** **18.5 SNFSR, OMPP, pages 118–20** **GMS1** Mea 5.1	compare the length, mass (weight), volume, or capacity of objects directly or indirectly (e.g., by comparing each of them with another object, used repeatedly) FF **Everyday counting:** **1.5–1.6** **1 SNFSR, RPSWC, SWMP, OMPP, pages 51–52** **2 OMPP, page 56** **3.5 LNPR, pages 58** **4 SWMP, RPSWC, page 64** **6 SSR, RPSWC, SWMP, EAD, OMPP, pages 71–72** **7 ADMT, SNFSR, MGP, RPSMC, pages 74–75** **8.4 LNPR, page 78** **9.3, 9.4 LNPR, page 82** **11 SWMP, page 92** **12 SWMP, page 96** **15.5 LNPR, SNFSR, page 107** **16 HFA, page 111** **17 MGP, RPSWC, OMPP, pages 115–16** **18.5 LNPR, SNFSR, OMPP, pages 118–20** **NPC1** SF 10 **GMS1** Mea 1, 4, 5	compare and order several objects using informal units of length, mass (weight), volume, or capacity **GMS1** Mea 1.1, 1.2, 4.1, 4.3, 5.1, 5.2 **NPC1** SF 4, NNS 3, 4, **NPC1** SF 10, P&A 1, 2, 3	compare and order objects using metric units of length, mass (weight), or capacity **GMS2** Mea 1, 4, 5, 6	**Investigate** practical measuring situations to compare and order objects – for example: • which is longer or shorter, is heaver or lighter, or holds more or less (at 6 months) • comparing and ordering up to three objects (at year 1) • **explaining** how identical informal units need to be used when measuring (at year 2) • using tools like rulers, measurement containers, and scales (at year 3). Use mathematical language to **explain** and **justify** comparative measurement attributes (e.g., long and short; heavy, heavier, and heaviest; the same as; full and empty; more and less; wide, wider, and widest). Include descriptive te reo Māori that makes the properties of objects and shapes clear. **Activity to follow**
			turn, and describe how far an object or person has turned, using full, half, and quarter turns as benchmarks **GMS1** Geo 5	turn, and describe how far an object or person has turned, using full, half, quarter, and three-quarter turns as benchmarks **GMS2** Geo 5	**Investigate** and **explain** situations involving angles as 'how far an object or person has turned.' Have students turn physical objects and themselves. **Connect** turns with fractions (e.g., half, a quarter, three quarters).

Measurement continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Measuring	connect days of the week to familiar events and daily routines (e.g., the class timetable). FF **Everyday counting:** **2 ADMT, page 54** **7 EAD, page 76** **8 ADMT, SSR, pages 78–79** **GMS1** Mea 3.1, 3.2, 3.3, 3.4, 6.1, 6.2, 6.3	identify how the passing of time is measured in years, months, weeks, days, hours name and order the days of the week, and sequence events in a day using everyday language of time **GMS1** Mea 3.1, 3.2, 3.3, 3.4, 6.1, 6.2, 6.3	name and order the months and seasons, and describe the duration of familiar events using months, weeks, days, and hours **GMS1** Mea 3.1, 3.2, 3.3 **NPC1** SF 1, NNS 1 **NPC1** SF 5, NNS 2 **NPC1** NNS 1.5 **NPC2** P&A 1.2, 1.3, 1.4	identify the duration of events using years, months, weeks, days, hours, minutes, and seconds **GMS1** Mea 3.1, 3.2, 3.3 **NPC2** P&A 1.2, 1.3, 1.4 **GMS3** Mea 2.3, 2.4, 2.5	Use visual representations to support the sequencing of events (e.g., pictorial daily timetables, calendars, day-and-month cards). Explore estimating the duration of everyday events using minutes and seconds (e.g., "How long is it until the bell rings?"). Practise recalling a sequence of events in the past and predicting future events. Use mathematical language to **explain** and **justify** comparisons of duration and points in time (e.g., before, after, soon, later, next, today, tomorrow, yesterday, 1st, 2nd, 3rd). **Investigate** using a calendar to work out the number of days, weeks, or months until important events (e.g., the number of days until Matariki, the number of weeks until the end of term). Explore informal ways of measuring short periods of time to identify which events last longer.
		tell the time to the hour using the language of 'o'clock'. **GMS1** Mea 3.4, 6.1, 6.2, 6.3	tell the time to the hour and half-hour, using the language of 'past' and 'o'clock' **GMS1** Mea 3, 4, 6	tell the time to the hour, half-hour, and quarter past and quarter to the hour **GMS1** Mea 6 **GMS2** Mea 7.1, 7.2, 7.3	Use digital and analogue clocks to have students practise telling the time. **Connect** using visual representations on an analogue clock to skip counting in 5s and fractions (a half and quarter). **Connect** the 'structure' of duration (minutes, hours, days) to our measures of time ("There are 30 minutes in half an hour, 60 minutes in an hour"). Identify and **investigate** the specific times of daily events and activities in and out of school.

Measurement continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Perimeter, area, and volume			visualise, estimate, and measure the perimeter and area of 2D shapes, using informal units. **GMS3** Mea 3.2 **GMS4** Mea 6.1, 6.3, 6.6 **Activity to follow**	visualise, estimate, and measure: the perimeter of polygons using metric units the area of 2D shapes using squares of identical size the volume of rectangular prisms (cuboids) by filling them with identical 3D blocks. **i GMS3** Mea 3.2 **GMS4** Mea 6.1, 6.3, 6.6 **ii GMS4** Mea 6.4, 6.5, 6.6 **iii GMS5** Mea 4.1, 4.2 **Activity to follow**	**Explain** and demonstrate that: • perimeter is the distance around the edge of a 2D shape • area is the size of the surface of a 2D shape, or how many squares cover the surface • volume is the amount of 3D space a shape takes up, or how many cubes fill the shape. **Investigate** familiar practical situations involving perimeter, area, and volume. Use think-alouds to demonstrate the use of visualising to identify the appropriate attribute for a measurement task and to imagine the number of units required. **Explain** the importance of using the same unit when measuring, and that there should be no gaps or overlaps around the outside (perimeter) and inside (area) of 2D shapes, and in filled 3D shapes (volume).

Geometry

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Shapes	identify, sort by one feature, and describe familiar 2D shapes **FF Everyday counting:** **3 SWMP, EAD, page 60** **4 ADMT, MGP, EAD, pages 62–64** **5 EAD, OMPP, UW, page 68** **6 EAD, OMPP, page 72** **10 SWMP, page 75** **13 EAD, page 100** **18 EAD, page 120** **Covered above plus further exploration through** **GMS1 Geo 1.1, 1.3, 1.4, 1.5, 3, 4**	identify, describe, and sort familiar 2D and 3D shapes presented in different orientations, including triangles, circles, rectangles (including squares), cubes, cylinders, and spheres **GMS1 Geo 1, 2, 3, 4**	identify, describe, and sort 2D and 3D shapes, including ovals, semicircles, polygons (e.g., hexagons, pentagons), rectangular prisms (cuboids), pyramids, hemispheres, and cones, using the attributes of shapes **GMS1 Geo 1, 3, 4** **GMS2 Geo 1, 2, 3, 4**	visualise, identify, compare, and sort 2D and 3D shapes, using the attributes of shapes **GMS2 Geo 1.3, 1.4, 2, 3, 4** **GMS3 Geo 1, 3**	Make available a range of 2D and 3D shapes, including tactile shapes and materials (e.g., playdough, pipe cleaners), pictures, diagrams, and digital tools. **Investigate** 2D and 3D shapes in the environment. Use everyday language and mathematical language (including te reo Māori) to **explain** and **justify** the describing and sorting of shapes (e.g., size, corners, colour, texture, sides, angles, faces, edges, vertices, triangle/tapatoru, square/tapawhā rite, same/ōrite, different/rerekē. Use **generalisations** made by students to clarify and extend understanding (e.g., "Polygons have straight sides", "2D shapes can be identified on 3D shapes").
				identify right angles in shapes and objects **GMS2 Geo 5.2, 5.4** **GMS3 Geo 2, 3.3**	
Spatial reasoning	compose by trial and error a target shape using smaller shapes, and decompose a shape into smaller shapes **FF Everyday counting:** **5 EAD, page 68** **GMS1 Geo 1.1, 1.2, 2.1, 2.2, 2.3**	anticipate which smaller shapes might be used to compose a target shape, and then check by making the shape **GMS1 Geo 1.1, 1.2, 2.1, 2.2, 2.3**	anticipate which smaller shapes might be used to compose and decompose a target shape, and then check by making the shape **GMS1 Geo 1.1, 1.2, 2**	compose and decompose 2D shapes using the attributes of shapes (e.g., lines of symmetry), other shapes, side lengths, and angles **GMS2 Geo 1.1, 1.2, 2, 3, 4**	Make available a range of materials to compose and decompose 2D shapes (e.g., pattern blocks, attribute shapes, paper shapes, playdough, tangrams). Use think-alouds to demonstrate anticipating how small shapes can fit into or make a new shape. Use as target shapes: • shapes partitioned into smaller parts (at 6 months) • continuous whole shapes with no partitions (at years 1–3).

Geometry continued...

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Spatial reasoning		flip, slide, and turn 2D shapes to make a pattern FF **Everyday counting:** **6 EAD, page 72** **18 EAD, page 120** **GMS1** Geo 1, 2, 2.4, 2.5	recognise lines of symmetry in patterns or pictures, and create or complete symmetrical pictures or patterns **GMS2 Geo 3**	predict the result of a one-step transformation (reflection, translation, or rotation) on 2D shapes **GMS1** Geo 1, 2 **GMS2** Geo 1.3, **Activity to follow**	**Connect** the informal vocabulary of flip, slide, and turn with the formal vocabulary of reflect, translate, and rotate. **Investigate** practical situations (e.g., making art, paper folding, checking symmetry with mirrors) and a range of artefacts and patterns.
Pathways	follow instructions to move to a familiar location or locate an object. FF **Everyday counting:** **17 OMPP, page 116** **18 ODPP, page 120** **GMS1** Geo 5	follow and give instructions to move to a familiar location or locate an object FF **Everyday counting:** **17 OMPP, page 116** **18 ODPP, page 120** **GMS1** Geo 5	follow and give instructions to move people or objects to a different location, using direction, distances (e.g., number of steps), and half and quarter turns **GMS1** Geo 5 **GMS2** Geo 5.1	follow and create a sequence of step-by-step instructions (an algorithm) for moving people or objects to a different location **GMS1** Geo 5 **GMS2** Geo 5.1	**Investigate** ways of moving to different locations within the classroom and in other parts of the school, using simple maps at year 3. Use picture books that emphasise positional language and movement (e.g., Scatter Cat, Bears in the Night, We're Going on a Moa Hunt). Use spatial language and talk frames to support giving and following instructions (e.g., near, far, next to, beside, on top, under, over, down, up, left, right, turn). Make **connections** between: • estimating distance and bodily measures (e.g., the number of steps to the door) • half and quarter turns and fractions • following or creating instructions and algorithmic thinking.
		use pictures, diagrams, or stories to describe the positions of objects and places. FF **Everyday counting:** **16 RPSWC, page 115** **GMS1** Geo 2, 5	interpret diagrams to describe the positions of objects and places in relation to other objects and places. **GMS1** Geo 5 **GMS2** Geo 5	interpret, draw, and use simple maps to locate objects and places relative to other objects and places. **GMS1** Geo 5 **GMS3** Geo 4	

Statistics: New Statistics and Probability content to follow soon

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Problem		pose a summary investigative question about a group for which the data will have categorical variables (e.g., colour, brand), and anticipate what the data might show	pose a summary investigative question about a group for which the data will have categorical variables, and anticipate what the data might show (e.g., which outcomes might be more frequent than others)	pose a summary investigative question about an everyday situation, using categorical data and discrete numerical (whole number) data, identify the variable and group of interest, and anticipate what the data might show	Show, with student input, how to: • pose summary investigative questions about an area of interest • identify the variable and group of interest in investigative questions.
Plan		plan to collect data by making observations or questioning others, and discuss how the data-gathering process might affect people	plan survey and data-collection questions for collecting data, identify who and what the data will measure, and discuss how the data-gathering process might affect people		Pose, with student input, survey and data-collection questions that will be used to collect the data required for the investigative question. **Explain** the distinction between primary and secondary data and the challenges that come with sensitive topics or questions. **Investigate** how survey questions and the words within survey questions can be interpreted differently by different people.
Data		collect categorical data for one variable	collect categorical data for more than one variable	collect, record, and sort data, or use secondary data sources provided by someone else	**Represent** data using data cards, recording sheets, and tally tables. Use data cards that **represent** multiple variables about an individual. Explore investigative questions using secondary data sources.

Statistics: New Statistics and Probability content to follow soon (continued...)

	During the first 6 months Informed by prior learning, teach students to:	**During the first year** Informed by prior learning, teach students to:	**During the second year** Informed by prior learning, teach students to:	**During the third year** Informed by prior learning, teach students to:	**Teaching considerations**
Analysis		create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, giving the frequency for each category	create and make statements about data visualisations (e.g., pictures, graphs, dot plots) for the categorical data, comparing the frequencies of categories	create and make statements about data visualisations (e.g., pictures, graphs, dot plots, bar graphs) for the categorical and discrete numerical data	Show creating and describing data visualisations, transitioning from data cards to dot plots to bar graphs. **Represent** data using data cards and picture graphs (for years 1–3), frequency tables and dot plots (for years 2–3), and bar graphs (for year 3). Have students practise using 'I notice' statements that include the variable name and context when describing data visualisations. **Explain** and demonstrate 'reading the data' and 'reading between the data'. **Explain** how to describe features of data visualisations (e.g., frequency, the least/most frequent category, modes or modal groups, highest and lowest values).
Conclusion		choose from given options the statements that best answer the investigative question		choose from given options the statements that best answer the investigative question, reflect on findings, and compare them with anticipated outcomes	Show, with student input, how to: • choose the best descriptive statements that answer an investigative question • collate, **explain**, and **justify** their findings to others.
Statistical literacy		agree or disagree with others' statements about simple data visualisations (e.g., pictures, graphs, dot plots).	match statements made by others with features in simple data visualisations, and agree or disagree with the statements.	identify relevant features in others' data visualisations, connect these to descriptive statements, agree or disagree with the statements, and suggest improvements to them.	Show, with student input, how to: • read and understand claims made by others and identify corresponding features in data visualisations • **explain** agreements or disagreements with a claim made by others.

Probability: New Statistics and Probability content to follow soon.

	During the first 6 months Informed by prior learning, teach students to:	During the first year Informed by prior learning, teach students to:	During the second year Informed by prior learning, teach students to:	During the third year Informed by prior learning, teach students to:	Teaching considerations
Probability investigations		engage in stories or games that involve chance-based situations and: • decide if something will happen, won't happen, or might happen • identify possible and impossible outcomes (e.g., for what might happen next).	engage in chance-based investigations about games and everyday situations to: • anticipate and then identify possible outcomes • collect and record data • create data visualisations for frequencies of possible outcomes (e.g., lists, pictures, graphs) • describe what these visualisations show • answer the investigative question • notice variations in outcomes (e.g., how often each of the numbers on a dice come up)		**Investigate** probability by playing games of chance using physical objects (e.g., dice, coins, spinners, pulling things out of a hat). **Explain** and show how to • list possible outcomes • visualise frequencies of outcomes • use the vocabulary that indicates the relative order of probabilities from impossible to certain (i.e., impossible, unlikely, possible, likely, certain).
Critical thinking in probability			agree or disagree with the statements made by others about chance-based situations.	explain and question statements about chance-based situations, with reference to data.	Show, with student input, how to: • read and understand claims made by others about chance situations • match statements with the relevant chance situation being described • **explain** and **justify** why they believe a statement is true or not.

Phase 2

Number

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Number structure	skip count from any multiple of 100, forwards or backwards in 25s and 50s **NPC3** NNS 3.1 **(100s)** **NPC3** P&A 3.6, 3.7 **NPC4** NNS 1.2			**Investigate** patterns in multiples using 100s boards or 1,000s books. Record choral counting on the board, and ask students to **explain** patterns and make **generalisations** or conjectures.
	identify, read, write, compare, and order whole numbers up to 10,000, and represent them using base 10 structure **NPC3** NNS 2, 5 **NPC4** NNS 1.3, 1.4, 1.5, 1.6, 2 **NPC5** NNS 1	identify, read, write, compare, and order whole numbers up to 100,000, and represent them using base 10 structure **NPC4** NNS 2 **NPC4** NNS 1.4, 1.5, 1.6 **NPC5** NNS 1	identify, read, write, compare, and order whole numbers up to 1,000,000, and represent them using base 10 structure **NPC5** NNS 1	Use marked number lines to order and compare numbers and place-value (PV) houses and materials to write and **represent** numbers, using base 10 structure. Support students to: • practise saying, reading, and writing given numbers, including large numbers, using PV houses • use PV houses to **generalise** that multiplying by 10 moves each digit in a number one place to the left, and dividing by 10 moves each digit one place to the right.
		identify factors of numbers up to 100 **NPC4** P&A 4 **NPC5** P&A 3.4, 3.5	identify square numbers and factors of numbers up to 125 **NPC5** P&A 3.4, 3.6, 3.7, 4.1, 4.4, 4.5, 4.6 **NPC6** P&A 1	**Represent** factors of numbers using arrays, or ordered lists of factor pairs. Use multiplication charts to **investigate** factors, multiples, and square numbers. **Connect** to students' understanding of a square to **explain** and **represent** a square number and multiplication facts involving the same two numbers.

Number continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Operations	use rounding, estimation, and inverse operations to predict results and to check the reasonableness of calculations **NPC3** Calc 1.4, 9.11, 13.2, 13.5 **NPC4** NNS 3	use rounding, estimation, and inverse operations to predict results and to check the reasonableness of calculations **NPC4** NNS 3.3, 3.4, 3.5, 3.6, 3.7 **NPC4** Calc 3.3, 4.3, 8.4, 8.5, 8.6, 8.7, 9.1, 9.3, 14.1 **NPC5** NNS 4	use rounding, estimation, and inverse operations to predict results and to check the reasonableness of calculations **NPC5** NNS 4.8 **NPC5** Calc 3.2, 3.3, 5.1, 5.3, 5.4 **NPC6** Calc 3	**Explain** how to round numbers to an appropriate value to make an estimate for a calculation. **Explain** reasoning using estimation language such as 'about', 'more or less', and 'close to'. **Connect** rounding with: • known benchmarks (e.g., doubles, halves, multiples of 10), to make estimations and check calculations • rounding to an appropriate unit in measurement situations. Use number lines to support rounding, **explaining** how to find the midpoint between two numbers. **Explain** and **justify** findings by **connecting** to estimates and other checking methods. Use families of facts to show the **connection** between factors and multiples. **Explain** how to use families of facts to 'work backwards' (e.g. 7 x 8 = 56, so 56 ÷ 8 = 7).
	round whole numbers to the nearest thousand, hundred, or ten **NPC3** NNS 6 **(nearest 10 or 100)** **NPC4** NNS 3, 6.7, 6.9	round whole numbers to the nearest ten thousand, thousand, hundred, or ten, and round tenths to the nearest whole number **NPC4** NNS 3.3, 3.4, 3.5, 3.6, 6.9 **NPC5** NNS 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8	round whole numbers to a specified power of 10, and round tenths and hundredths to the nearest whole number or one decimal place **NPC4** NNS 6.9 **(tenths)** **NPC5** NNS 4 **NPC6** Calc 3	
	add and subtract two- and three-digit numbers **NPC3 Calc** 8, 9, 12, 13, 14	add and subtract whole numbers up to 10,000 **NPC4** Calc 1, 2, 3, 4, 8, 9	add and subtract any whole numbers **NPC5** Calc 1, 2, 3, 5, 6 **NPC6** Calc 1.4, 1.5	**Explain** and **represent** addition and subtraction using materials such as PV materials, number lines, and number discs. **Explain** and **connect**: • the horizontal method and the vertical-column method of addition or subtraction • making estimates or mental calculations using place value, partitioning, and known facts. Use worked examples and a range of problem types (e.g., result, change and start-unknown), using think-alouds to **explain** the most efficient approaches. Have students practise decoding and solving word problems, **representing** them as equations.

Number continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Operations	recall multiplication and corresponding division facts for 4s and 6s **NPC3** Calc 10 **(2, 4, 8 times tables)** **NPC4** Calc 5, 6	recall multiplication facts for 7s, 8s, and 9s and corresponding division facts **NPC3** Calc 10 **(2, 4, 8 times tables)** **NPC4** Calc 5, 6	recall multiplication facts to at least 10 x 10 and corresponding division facts **NPC4** Calc 5, 6 **NPC5** Calc 4.1	Provide a range of tasks for students to practise and develop fluency in new and previously learned multiplication and division facts (e.g., families of facts, multiplication table grids, arrays, games). **Investigate** patterns in the multiples of times tables and to **generalise** multiplication problems beyond recalled facts by looking for patterns.
	multiply a two-digit by one-digit number and two one-digit whole numbers (e.g., 23 x 5, 7 x 8) **NPC3** Calc 5, 6, 10, 15.1, 15.2, 15.4, 15.5, 15.6, 15.7 **NPC4** Calc 10, 12.1, 12.2, 12.3	multiply a three-digit by one-digit number and two two-digit whole numbers (e.g., 245 x 6, 34 x 83) **NPC4** Calc 12.4, 12.5, 12.6 **NPC5** Calc 12	multiply multi-digit whole numbers (e.g., 54 x 112) **NPC5** Calc 4.5, 7.1, 7.3, 8.1, 8.2, 12 **NPC6** Calc 2.1, 2.2	At year 4: • **connect** multiplication with skip counting using jumps on a number line or arrays • **represent** division using diagrams and equal sharing, **connecting** with known families of facts • **generalise** the distributive property of multiplication over addition (e.g., 7 x 8 = 7 (5 + 3) = (7 5) + (7 3). • At years 5–6, **represent** multiplication using the area model, and make **connections** with place value (e.g., 34 x 7 = 30 x 7 + 4 x 7). **Explain** and demonstrate: • the vertical-column method for division and multiplication, ensuring students understand and practise the procedure and **connect** with place value, known facts, and estimation • making estimates or mental calculations by **connecting** to place value, partitioning, and known facts. Have students **investigate**: • decoding and solving word problems, **representing** them as equations • multiplication and division in measurement and proportional reasoning situations • multiplication to count different combinations (e.g., "If I have 4 tops and 3 pairs of shorts, how many different outfits can I make?")
	divide up to a three-digit whole number by a one-digit divisor, with no remainder (e.g., 65 ÷ 5) **NPC3** Calc 7.1, 7.2, 7.3, 7.4, 7.5, 11.1, 11.2, 11.3, 15.3, 15.4, 15.5, 15.6, 15.8, 16.1, 16.2, 16.3	divide up to a three-digit whole number by a one-digit divisor, with a remainder (e.g., 83 ÷ 5 = 16, remainder 3) **NPC3** Calc 7.6, 11.2, 11.4 **NPC4** Calc 11.4, 11.6, 13	divide up to a four-digit whole number by a one-digit divisor, with a remainder (e.g., 198 ÷ 7, 4154 ÷ 8) **NPC5** Calc 4.3, 4.6, 7.2, 7.3, 8.4, 9.1, 9.2, 13.1, 13.2, 13.3	

Number continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Operations			use the order of operations rule with grouping, addition, subtraction, multiplication, and division **NPC6** Calc 6.3, 6.4, 6.5 **NPC6 PFT** 3.5, 5.4	Use worked examples to demonstrate a step-by-step layout with one equal sign per line. Have students **investigate**: • decoding and solving word problems, deciding which operation to use and why • the distributive property of multiplication over addition and subtraction (e.g., 6 x 18 = 6 (20 – 2) = (6 x 20) – (6 x 2). • **Explain** the commutative, associative, and identity properties, and **justify** which operations they work for and which they don't.
Rational numbers	identify, read, write, and represent tenths as fractions and decimals **NPC3 NNS** 7.1, 8.2 **NPC4** NNS 5.2, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6	identify, read, write, and represent tenths and hundredths as fractions and decimals **NPC4** NNS 6, 7.5, 8	fractions, decimals (to two places), and related percentages **NPC5** NNS 3.2, 3.3, 3.4, 3.5, 7.1 **NPC5** Calc 11.1, 11.2	**Represent** and compare fractions, decimals and percentages using continuous materials (double number lines, fraction walls, 100s squares). Have students practise saying, reading, and writing decimals using decimal PV houses. **Explain** and **represent** decimal tenths as a fraction with the denominator as 10, and percentages and decimals (to two places) as a fraction with the denominator of 100. **Investigate** situations where decimals are used (e.g., in measurements at a sports day).
	compare and order tenths as fractions and decimals, and convert decimal tenths to fractions (e.g., 0.3 = $\frac{3}{10}$) **NPC3** NNS 7.3 **NPC4** NNS 6.7	compare and order tenths and hundredths as fractions and decimals, and convert decimal tenths and hundredths to fractions **NPC 4** NNS 6.3, 6.7, 6.8, 8.2, 8.7, 8.8	compare and order fractions, decimals (to two places), and percentages and convert decimals, and percentages to fractions **NPC5** NNS 3.7, 3.8, 6.1, 6.2, 6.3, 7.4 **NPC5 Calc 11.5, 11.6**	
	divide whole numbers by 10 to make decimals **NPC3** Calc 15.5, 15.6 **NPC4** NNS 6.4 **NPC4** Calc 7.3, 7.5	divide whole numbers by 10 and 100 to make decimals **NPC4** NNS 6.5, 8.4 **NPC4** Calc 7.3, 7.5, 7.6, 7.7 **NPC5** Calc 7.4, 7.5, 7.6	multiply and divide numbers by 10 and 100 to make decimals and whole numbers (e.g. 1.3 x 10 = 13) **NPC5** Calc 7 **(multiply and divide by 10 and 100 only)** **NPC6** Calc 2.4	Use decimal PV houses to **generalise** that multiplying by 10 moves each digit in a number one place to the left (increasing the place value of the digit), and dividing moves each digit one place to the right (decreasing the place value of the digit).

Number continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Rational numbers	for fractions with related denominators of 2, 4, and 8, 3 and 6, or 5 and 10: compare and order the fractions identify when two fractions are equivalent by directly comparing them, noticing the simplest form (e.g. $\frac{3}{6} = \frac{1}{2}$ and $\frac{1}{2}$, which is the simplest form) **i NPC3** NNS 7.3 **NPC4** NNS 5.1, 5.3, 5.4 **ii NPC3** NNS 7.6, 7.7, 8.6 **NPC4** NNS 5.2, 7.2, 7.3, 7.4	for fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, or 100: compare and order the fractions identify when two fractions are equivalent **i NPC4** NNS 5.1, 5.3, 5.4 **ii NPC4** NNS 5.2, 7.2, 7.3	for fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, or 100: compare and order the fractions identify when two fractions are equivalent represent the fractions in their simplest form **i NPC5** NNS 6.1, 6.2, 6.3 **ii NPC5** NNS 2.5, 2.7 **iii NPC4** NNS 7.1, 7.4, **NPC5** NNS 6.4, 6.5	Use fraction walls (equivalence materials) to **represent** and **investigate** the relationship between the denominator and numerator in a fraction and how we can use this to simplify the fraction. Make **connections** with known facts such as halving and dividing by 4. Count forwards and backwards in fractions, and place fractions on marked and unmarked number lines.
	convert (using number lines) between mixed numbers and improper fractions with denominators of 2, 3, 4, 5, 6, 8, and 10 **NPC3** NNS 8 **NPC4** NNS 5.5, 6.3	convert between mixed numbers and improper fractions with denominators of up to 10 **NPC5** NNS 2.1, 2.2, 2.3, **2.4**	convert between mixed numbers and improper fractions **NPC5** NNS 2.1, 2.3, 2.4	**Represent** improper fractions using words and materials, and place them on a number line. At years 5–6, **explain** conversion as division with a remainder (e.g., $\frac{11}{4} = 2\ \frac{3}{4}$ (11 divided by 4 = 2 r 3)) or multiplication plus a remainder (e.g., $1\ \frac{1}{5} = \frac{6}{5}$ (1 x 5 + 1)).
	find a unit fraction of a whole number, using multiplication or division facts and where the answer is a whole number (e.g., of 40) identify, from a unit fraction part of a set, the whole set **NPC3** NNS 8.7, 8.8 **NPC3** Calc 16.4, 16.5, 16.6 **NPC4** NNS 7.3 **NPC4** Calc 11.5 **Activity to follow**	• find a fraction of a whole number, using multiplication and division facts and where the answer is a whole number (e.g., $\frac{2}{3}$ of 24) **NPC4** Calc 11.1, 11.2, 11.5 • identify, from a fractional part of a set, the whole set **Activity to follow**	• find a fraction or percentage of a whole number where the answer is a whole number (e.g., $\frac{3}{8}$ of 48, 30% of $150) **i NPC5** NNS 7.2, 7.3, 7.5, 7.6 **NPC5** Calc 11.3, 14 **[NB. Need to double check this mapping]** • identify, from a fractional part of a set, the whole set **OUP to link to new activity created for Y5 for consolidation as wording is the same: 'identify, from a fractional part of a set, the whole set'.**	Use bar models, diagrams, or paper strips to **represent** equal parts of a whole. At year 4, **represent** parts of a whole set using discrete materials to make equal groups. At years 5–6, **connect** percentages and fractions of a whole to known facts and benchmarks (e.g., 25% and dividing by 4).

Number continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Rational numbers	add and subtract fractions with the same denominators to make up to one whole (e.g., $\frac{3}{8} + \frac{3}{8} + \frac{2}{8} = \frac{8}{8} = 1$) **NPC3** NNS 7.4, 8.5	add and subtract fractions with the same denominators, including to make more than one whole **NPC4** NNS 5.5	add and subtract fractions with the same or related denominators (e.g., $\frac{1}{4} + \frac{1}{8}$ **NPC5** Calc 15.1, 15.2, 15.3, 15.4	**Represen**t the addition and subtraction of fractions using fraction walls, number lines, and equations. At years 4–5, **explain** that, when adding and subtracting fractions with the same denominator, the numerators are added or subtracted but the denominator stays the same. At year 6, **explain** how to use equivalent fractions to rename fractions so that they all have the same denominator. Then add or subtract the numerators.
	add and subtract decimals to one decimal place (e.g., 1.3 + 0.2 = 1.5) **NPC5** Calc 2.6 + Prac & Dis PW 5, 6, 3.4 **Activity to follow**	add and subtract whole numbers and decimals to two decimal places (e.g., 32.55 – 21.21 = 11.34) **NPC4** Calc 8.7, 9.5 **NPC5** Calc 1.2, 1.3, 1.5, 1.6, 2.5, 2.6, 3.4, 3.5, 3.6, 5.4, 5.5, 6.3, 6.4, 6.5	add and subtract whole numbers and decimals to two decimal places (e.g., 250.11 + 135.29 = 385.4) **NPC5** Calc 1.2, 1.3, 1.5, 1.6, 2.5, 2.6, 3.4, 3.5, 3.6, 5.4, 5.5, 6.3, 6.4, 6.5	**Explain** and demonstrate both the horizontal method for **representing** an equation, and the vertical-column method for addition or subtraction. **Investigate** and **connect** the addition and subtraction of decimals in measurement situations. At year 4, use number lines and decimals to add and subtract tenths, **connecting** tenths as fractions with tenths as decimals. At years 5–6, **connect** to methods of adding and subtracting whole numbers.
	use doubling or halving to scale a quantity (e.g., to double or halve a recipe) **NPC3** Calc 15.1, 16.1 **GMS3** Mea 5.3, 5.6	use known multiplication facts to scale a quantity **NPC4** Calc 5.7, 6.8	use known multiplication and division facts to scale a quantity **NPC5** NNS 2.6 **NPC5** Calc 10.1, 10.2	**Represent** the multiplicative relationship using diagrams, materials, and bar models. Use problems such as "If this recipe feeds 4 people, how much of each ingredient do we need to feed 20 people?"
Financial mathematics	make amounts of money using dollars and cents (e.g., to make 3 dollars and 70 cents) **NPC3** NNS 4.3, 4.4, 4.5 **GMS3** Mea 4	represent money values in multiple ways using notes and coins **NPC3** NNS 4.3, 4.4, 4.5 **GMS3** Mea 4	• solve problems involving purchases (e.g., ensuring they have enough money) • create simple financial plans (e.g., shopping lists, a family budget) **NPC4** P&A 2.6, Calc 3.1, 3.2, 3.7, **4.1,** **GMS4** Mea 2.3, 2.4, 2.5 **NPC5** P&A 2.5, Calc 1.2, 1.5, 14.3, 16.4	Have students practise grouping denominations and making amounts using play money, **connecting** with place value, skip counting, and multiplication. **Investigate** authentic financial situations and **represent** findings using equations, spreadsheets, and tables.
	estimate and calculate the total cost and change for items costing whole-dollar amounts. **NPC3** Calc 8, 13.5 **NPC4** Calc 3.7	estimate to the nearest dollar and calculate the total cost of items costing dollars and cents, and the change from the nearest ten dollars **NPC4** NNS 3.6, 3.7 **NPC4** Calc 1.4, 3.7 **GMS4** Mea 2.2	calculate 10%, 25%, and 50% of whole-dollar amounts (e.g., 50% of $280). **NPC5** Calc 11.4 **Activity to follow**	**Investigate** practical situations involving calculating costs and giving change. At year 6: • use bar models to **represent** percentages of whole-dollar amounts, and **connect** to equivalent fractions • **explain** the procedure of dividing a whole by 10, to find 10%, 2 to find 50%, or 4 to find 25%.

Alegbra

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Equations and relationships	form and solve true or false number sentences and open number sentences involving multiplication and division, using an understanding of the equal sign (e.g., 5 x __ = 20; __ ÷ 3 = 6) **NPC3** Calc 6.4 **NPC4** P&A 2.4, 2.6, 3.6 **NPC4** Calc 6.5, 7.6 **Activity to follow**	form and solve true or false number sentences and open number sentences involving all four operations (e.g., 674 + 56 – __ = 671) **NPC3** Calc 9.12 **NPC4** P&A 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.2, 3.4, 3.5, 3.6 **NPC4** Calc 1.7, 3.4, 6.5, 7.6, 8.2 **Activity to follow**	form and solve true or false number sentences and open number sentences involving all four operations, using an understanding of equality or inequality (e.g., 8 x 7 < 8 x 5 + 8 (T or F?) **NPC4** P&A 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3 **NPC5** P&A 2, 5 **Activity to follow**	**Represent** the equal sign as 'the same as' to demonstrate it is a symbol of equivalence. **Explain** the difference between an expression (e.g., 4 x 5), an equation (e.g., 4 x 5 = 20), and an inequality (e.g., 4 x 5 < 4 x 6). Have students practise the use of equal and inequality symbols. **Investigate** inverse operations to find missing numbers in equations.
	recognise and describe the rule for a growing pattern using words, tables, and diagrams, and make conjectures about further elements in the pattern **NPC3** P&A 2.5, 2.6, 4 **NPC3** Calc 6.5	use tables to recognise the relationship between the ordinal position and its corresponding element in a growing pattern, develop a rule for the pattern in words, and make conjectures about further elements or terms in the pattern **NPC4** P&A 1, 5, 7	use tables, XY graphs, and diagrams to recognise relationships in a linear pattern, develop a rule for the pattern in words (i.e., that there is a constant amount of change between consecutive elements or terms), and make conjectures about further elements in the pattern **NPC5** P&A 4, 6 **NPC5** Calc 10.4, 10.5 **GMS5** Mea 2.2, 2.3, 2.4, 2.5, 2.6, 7.3, 7.4	**Explain** vocabulary in relation to patterns (e.g., ordinal, element, term, position, rule) and how to record the position and term for each element in a pattern. **Investigate** visual patterns (e.g., tivaevae), making block patterns and **representing** patterns using pictures and materials.

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	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Algorithmic thinking	create and use an algorithm for generating a pattern or pathway. **GMS3** Geo 2.1, 2.2, 4 **Activity to follow**	create and use an algorithm for generating a pattern, procedure, or pathway. **GMS3** Geo 2.1, 2.2, 4 **Activity to follow**	create and use algorithms for making decisions that involve clear choices. **GMS4** Geo 1.4 **NPC5** P&A 2, 5, 6 **NPC5** Calc 1.7, 16 **NPC6** P&A 2.3, 2.4	**Represent** a procedure as a sequence of step-by-step instructions (an algorithm). Follow the sequence by 'acting it out', asking students to describe and record each step. **Investigate** giving directions for, or describing, the most efficient pathway on a maze or map, and sorting numbers according to a set of instructions (e.g., "Sort the odd numbers … the multiples of 5"). **Explain** and **justify** how a procedure has been broken into steps, the order of the steps, whether there were any errors or omissions, and, if so, how they were corrected. At years 4–5, **investigate** creating a sequence of instructions (e.g., to draw a polygon or move through a maze), using digital tools or on paper. **Connect** with geometry when giving directions or describing pathways. At year 5, **connect** algorithmic thinking to a procedure for an operation (e.g., for multiplying two numbers). At years 5–6, **investigate** identifying the transformations used to create geometric patterns. At year 6, **investigate** using classification diagrams to identify an object, a shape, or data object based on multiple characteristics.

Measurement

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Measuring	measure body parts (e.g., the arm) or familiar objects and use these as benchmarks to estimate and then measure length, mass (weight), capacity, and duration, using appropriate metric or time-based units **NPC2** Mea 1.5 **GMS3** Mea 1, 2, 3.1, 3.2, 3.3, 3.4, 3.5, 5.1, 5.2, 5.3, 5.4, 5.5, 6 **NPC3** NNS 6.4, 6.5, 6.8	estimate and then accurately measure length, mass (weight), capacity, temperature, and duration, using appropriate metric or time-based units or a combination of units **GMS2** Mea 6.4 **GMS3** Mea 1.4, 3.3, 5.1, 5.5, 6.1 **GMS4** Mea 1.1, 3.1, 3.2, 3.3, 4.3	estimate and then accurately measure length, mass (weight), capacity, temperature, and duration, using appropriate metric or time-based units or a combination of units **GMS2** Mea 6.4 **GMS3** Mea 1.4, 3.3, 5.1, 5.5, 6.1 **GMS4** Mea 1.1, 3.1, 3.2, 3.3, 4.3 **GMS5** Mea 1.1, 4.4, 4.5	**Investigate** practical measuring situations, and have students practise the accurate use and reading of rulers, scales, timers, thermometers, and measuring jugs. **Explain** and accurately measure: • at year 4, centimetres, metres, grams, kilograms, and litres, **connecting** with half units (e.g., 500mL = 0.5L) • at years 5–6, centimetres, metres, millimetres, grams, kilograms, litres, millilitres, and degrees Celsius. **Connect** reading a measuring tool with rounding to the nearest given unit (e.g., 3.6 cm to the nearest cm). Discuss the meaning of measurements in context. **Explain** benchmarks and prompt students to develop them (e.g., "A big step is about a metre, so roughly how long is our classroom?")
	use appropriate units to describe length, mass (weight), capacity, and time **Covered above**	use the appropriate tool for a measurement and the appropriate unit for the attribute being measured **Covered above**	select and use the appropriate tool for a measurement and the appropriate unit for the attribute being measured **Covered above**	**Explain** and **justify** the use of appropriate metric units or tools for measuring a given attribute with the precision necessary for the problem, noting that using smaller units provides more accuracy.
	use the metric measurement system to explore relationships between units GMS3 Mea 2.3, 2.4, 2.5, 3.1, 3.4, 5.2, 6.2, 6.4 NPC3 NNS 6.8	use the metric measurement system to explore relationships between units, including relationships represented by benchmark fractions and decimals GMS3 Mea 3.1, 3.4, 5.1, 5.2, 5.3, 6.2, 6.4 GMS4 Mea 3.2, 3.3, 3.4, 3.6, 4, 5	convert between common metric units for length, mass (weight), and capacity, and use decimals to express parts of wholes in measurements GMS4 Mea 3.2, 3.3, 3.4, 3.6, 4, 5 GMS5 Mea 1.1, 4.4, 4.5, 4.6, 7.5	**Explain** measurement prefixes (e.g., milli-, centi-) and how they **connect** metric units, and how they are based on powers of ten and relate to place value. **Investigate** how measures can be partitioned and combined like other numbers, and how smaller units are created by equally partitioning larger units.

Measurement continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Measuring	recognise that angles can be measured in degrees, using 90, 180, and 360 degrees as benchmarks **GMS3** Mea 2.3, 2.4, 2.5, 3.1, 3.4, 5.2, 6.2, 6.4 **NPC3** NNS 6.8	describe angles using the terms acute, right, obtuse, straight, and reflex, comparing them with benchmarks of 90, 180, and 360 degrees **GMS3** Mea 3.1, 3.4, 5.1, 5.2, 5.3, 6.2, 6.4 **GMS4** Mea 3.2, 3.3, 3.4, 3.6, 4, 5	visualise, measure, and draw (to the nearest degree) the amount of turn in angles up to 360 degrees **GMS4** Mea 3.2, 3.3, 3.4, 3.6, 4, 5 **GMS5** Mea 1.1, 4.4, 4.5, 4.6, 7.5	**Investigate** different angles using physical and digital tools and angles in the environment, and comparing and classifying them as acute, right, reflex, or obtuse. Make **connections** between angles, fractions of a circle, and turns. At year 6, **explain**, demonstrate, and have students practise estimating angles and measuring and drawing them using a protractor.
	recognise that angles can be measured in degrees, using 90, 180, and 360 degrees as benchmarks **GMS3** Geo 2 **GMS4** Geo 3 **GMS5** Geo 1, 3	describe angles using the terms acute, right, obtuse, straight, and reflex, comparing them with benchmarks of 90, 180, and 360 degrees **GMS3** Geo 2 **GMS4** Geo 1, 3 **(acute, right, obtuse)** **GMS5** Geo 1, 3 **(degrees, reflex, straight line)**	visualise, measure, and draw (to the nearest degree) the amount of turn in angles up to 360 degrees **GMS5** Geo 1, 3	**Investigate** different angles using physical and digital tools and angles in the environment, and comparing and classifying them as acute, right, reflex, or obtuse. Make **connections** between angles, fractions of a circle, and turns. At year 6, **explain**, demonstrate, and have students practise estimating angles and measuring and drawing them using a protractor.
	tell the time to the nearest 5 minutes, using the language of 'minutes past the hour' and 'to the hour' **GMS2** Mea 7.4	describe the differences in duration between units of time (e.g., days and weeks, months, and years), and solve duration-of-time problems involving 'am' and 'pm' notation **i** **GMS2** Mea 7.3 **GMS3** Mea 2.2, 2.3, 2.4, 2.5 **GMS4** Mea 1.4 **Ii** **GMS3** Mea 1.5, 2.1, 2.2 **GMS4** Mea 1.3, 1.5	convert between units of time and solve duration-of-time problems, in both 12- and 24-hour time systems **GMS4** Mea 1 **GMS5** Mea 7.2 **NPC5** Calc 2.3	**Represent** time using: • digital and analogue clocks (at year 4), to practise telling the time • analogue and digital forms (e.g., "It's 12:45, or a quarter to one.") **Investigate** using calendars, timetables, schedules, and number lines to work out the time between two events or the duration of an event. Explore solar calendars (e.g., Roman, Gregorian) and lunar calendars (e.g., maramataka Māori, Chinese). **Explain** subtracting for duration and inclusive counting (e.g., "For the number of days between now and next Tuesday, start counting from today"). **Explain** relationships between the units of time (e.g., 60 seconds to the minute, 60 minutes to the hour, 24 hours in a day, 365 days in a year), and use them to convert between units of time.

Measurement continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Perimeter, area, and volume	visualise, estimate, and measure: • the perimeter of polygons, using metric units (cm and m) • the area of shapes covered with squares or half squares • the volume of shapes filled with centicubes, taking note of layers and stacking. **i GMS3** Mea 3.2 **GMS4** Mea 6.1, 6.2, 6.3, 6.6 **ii GMS4** Mea 6.4, 6.5, 6.6 **iii GMS5** Mea 4.1, 4.2	visualise, estimate, and calculate: • the perimeter of regular polygons (in m, cm, and mm) • the area of shapes covered with squares or partial squares • the volume of rectangular prisms filled with centicubes, taking note of layers and stacking. **i GMS3** Mea 3.2 **GMS4** Mea 6.1, 6.2, 6.3, 6.6 **ii GMS4** Mea 6.4, 6.5, 6.6 **iii GMS5** Mea 4.1, 4.3	visualise, estimate, and calculate the area of rectangles and right-angled triangles (in cm2 and m2) and the volume of rectangular prisms (in cm3), by applying multiplication. **GMS4** Mea 6.4, 6.5 **GMS5** Mea 3, 4.1, 4.2, 4.3, 4.4 **GMS6** Mea 2.2	**Investigate** practical measuring situations and **connect**: • finding area with multiplication arrays • finding area and volume with the commutative property of multiplication • how part-units can be combined using number concepts, when finding the area of a shape • the area of a right-angled triangle with half the area of a square. Have students represent written methods for calculating, with clearly laid-out working.

Geometry

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Shapes	identify, classify, and describe the attributes of polygons (including triangles and quadrilaterals) using properties of shapes, including line and rotational symmetry **GMS3** Geo 2.4, 3.1, 3.2, 3.4, 3.5 **GMS4** Geo 1	identify, classify, and describe the attributes of: • regular and irregular polygons, using edges, vertices, and angles • prisms, using cross sections, faces, edges, and vertice **i GMS3** Geo 2.4, 3.1, 3.2 **GMS4** Geo 2.5, 3.2, 3.4 **ii GMS2** Geo 2.4, 4.2, 4.3, 4.4 **GMS3** Geo 3.1, 3.2, 3.3	identify, classify, and explain similarities and differences between: • 2D shapes, including different types of triangle • prisms and pyramids **GMS3** Geo 2.1, 2.2 **i GMS4** Geo 1 **i and ii GMS3** Geo 3	Use a range of 2D and 3D shapes, including tactile shapes, diagrams, student-made constructions, and digital shapes. **Investigate** line and rotational symmetry using mirrors and tracing paper. **Connect** to algorithmic thinking by making classification diagrams for classifying shapes.
	compare angles in 2D shapes, classifying them as equal to, smaller than, or larger than a right angle **GMS3** Geo 2.3, 3.1, 3.2, 3.4 **GMS4 Geo 1.4, Geo** 3.2, 3.3	identify and describe parallel and perpendicular lines, including those forming the sides of polygons **GMS3** Geo 1.1, 1.2, 1.3, 1.4	identify and describe the interior angles of triangles and quadrilaterals **GMS4** Geo 3 **GMS5** Geo 1.1, 1.2, 1.5, 3.2 **(interior angles only)**, 3.3, 3.4, 3.5	**Investigate** interior angles using digital tools and paper shapes to **generalise** that the interior angles of a triangle add to 180° and those of a quadrilateral add to 360°. **Connect** these understandings to ideas about right angles, straight lines, and full turns.
Spatial reasoning	identify the 2D shapes that compose 3D shapes (e.g., a triangular prism is made from two triangles and three rectangles) **GMS2 Geo** 4.2, 4.3, 4.4 **GMS3** Geo 1.3, 1.4	visualise 3D shapes and connect them with nets, 2D diagrams, verbal descriptions, and the same shapes drawn from different perspectives **GMS6** Mea 3	visualise and draw nets for rectangular prisms **GMS6** Mea 3.1, 3.3	**Represent** 3D shapes using digital tools, sketches, blocks, and student-made constructions. **Investigate** nets that will or will not fold, and match solid shapes with nets.
	visualise, predict, and identify which shape is a reflection, rotation, or translation of a given 2D shape **Activity to follow**	resize (enlarge or reduce) a 2D shape **GMS5** Mea 6.4	visualise, create, and describe 2D geometric patterns and tessellations, using rotation, reflection, and translation and identifying the properties of shapes that do not change **GMS4** Geo 3.4 **(tessellation)** **GMS5** Geo 2	**Investigate** using 2D shapes, squared paper, mirrors, and tracing paper to make and test conjectures about the effects of transformations. At year 5, use a grid to scale a shape and **connect** the scaling with multiplication or division. At year 6, **generalise** the properties of shapes that do not change when transformed (e.g., "Which properties of a square stay the same when we rotate it 90 degrees?")

Geometry continued...

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Pathways	• use grid references to identify regions and plot positions on a grid map • interpret and describe pathways, including those involving half and quarter turns and the distance travelled. **GMS3** Geo 4 **GMS4** Geo 4.1, 4.2, 4.3	interpret and create grid maps to plot positions and pathways, using grid references and directional language, including the four main compass points. **GMS3** Geo 2.1, 2.2, 2.3, 4 **GMS4** Geo 4.1, 4.2, 4.3	• interpret and create grid references and simple scales on maps • use directional language, including the four main compass points, turn (in degrees), and distance (in m, km) to locate and describe positions and pathways. **GMS3** Geo 4.3 **GMS4** Geo 4 **GMS5** Geo 1.3, 1.4 **GMS6** Inv 3	I**nvestigate** different types of maps (e.g., schematic, topographical, and digital maps). **Activity to follow** **Explain** pathways using directional language, including te reo Māori (e.g., whakamua/forwards, whakamuri/backwards, whakamauī/to the left, whakamatau/to the right, raki/north, tonga/south, rāwhiti/east, uru/west). **Connect** compass points and directional language with turns and angles, and simple scales with proportional reasoning.

Statistics: New Statistics and Probability content to follow soon

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Problem	use multivariate data to investigate summary and comparison situations with categorical and discrete numerical data, by: • posing an investigative question that can be answered with data • making conjectures or assertions about expected findings		use multivariate data to investigate summary, comparison, and time-series situations, by: • posing an investigative question that can be answered with data • making conjectures or assertions about expected findings	Show, with student input, how to: • pose summary and comparison investigative questions • pose time-series investigative questions (at year 6). **Connect** questions to areas of interest and value to the students and their communities.
Plan	plan how to collect primary data to support answering the investigative question, including: • deciding on the group of interest • deciding on the variable or variables for which data will be collected • taking account of ethical practices in data collection		plan how to collect primary data or how to use provided data, including identifying the variables of interest and, for provided data: • identifying who the data was collected from • identifying the original investigator's purpose for collecting the data • deciding if the source is reliable (e.g., by checking if survey questions appear to be biased towards a particular point of view)	Show, with student input, how to: • ask interrogative questions about sources and ethical practices • develop and closely examine survey or data-collection questions • define or establish measures for variables • identify 'who, what, where, when, and how' when using secondary datasets.
Data	use a variety of tools to collect the data, and check for errors in it	use a variety of tools to collect the data, check for errors in it, and correct them by re-collecting the data, if possible	collect primary data and check for errors, and provide information about variables in secondary data (e.g., how data was collected for them and possible outcomes for them)	Show, with student input, how to: • use a range of representations for recording data • identify what errors in data look like. **Connect** multiple variables for individuals, **explaining** that most datasets use a table design in which each row focuses on an individual and each column includes the data on multiple individuals for one variable.

Statistics: New Statistics and Probability content to follow soon (continued...)

	During year 4 Informed by prior learning, teach students to:	**During year 5** Informed by prior learning, teach students to:	**During year 6** Informed by prior learning, teach students to:	**Teaching considerations**
Analysis	create and describe data visualisations to make meaning from the data, with statements including the name of the variable	create and describe data visualisations to make meaning from the data, with statements including the names of the variable and group of interest	create and describe a variety of data visualisations to make meaning from the data, identifying features, patterns, and trends in context, and including the variable and group of interest	Show, with student input, how to: • represent and analyse data visualisations, creating them at first by hand and then with digital tools • identify the different features of data that the data visualisation reveals and how to describe them • read the data, and read 'between' the data. **Explain** how different data visualisations have different features and how to describe them in context (e.g., in relation to frequency, modes, modal groups, patterns, trends, values for numerical variables).
Conclusion	choose descriptive statements that best answer the investigative question, reflecting on findings and how they compare with initial conjectures or assertions	answer the investigative question, comparing findings with initial conjectures or assertions and their existing knowledge of the world		Show, with student input, how to: • choose the best descriptive statements that answer an investigative question • prepare their findings and **explain** them to others.
Statistical literacy	check the statements that others make about data to see if they make sense, using information to clarify or correct statements where needed.	check and, if necessary, improve the statements others make about data, including data from two or more sources.	identify, explain, check, and, if necessary, improve features in others' data investigations (e.g., biased survey questions, misleading information or statements).	Show, with student input, how to: • identify misleading data visualisations, match others' data visualisations with their statements, and check the claims made by others • interpret pie graphs (but not how to create them) • **explain** and **justify** the effectiveness of data visualisations in representing others' findings, using interrogative questions.

Probability: New Statistics and Probability content to follow soon.

	During year 4 Informed by prior learning, teach students to:	During year 5 Informed by prior learning, teach students to:	During year 6 Informed by prior learning, teach students to:	Teaching considerations
Probability investigations	engage in chance-based investigations with equally likely outcomes by: • posing an investigative question • anticipating and then identifying possible outcomes for the investigative question • generating all possible ways to get each outcome (a theoretical approach), or undertaking a probability experiment and recording the occurrences of each outcome • creating data visualisations for possible outcomes • describing what these visualisations show • finding probabilities as fractions • answering the investigative question • reflecting on anticipated outcomes	engage in chance-based investigations, including those with not equally likely outcomes, by: • posing an investigative question • anticipating and then identifying possible outcomes for the investigative question • generating all possible ways to get each outcome (a theoretical approach), or undertaking a probability experiment and recording the occurrences of each outcome • creating data visualisations for possible outcomes • describing what these visualisations show • finding probabilities as fractions • answering the investigative question • reflecting on anticipated outcomes • (at year 6) comparing findings from the probability experiment and associated theoretical probabilities, if the theoretical model exists		**Investigate** everyday chance-based situations in order to explore and experience the chance, randomness, variation, and distribution of outcomes. Use digital tools to conduct a large number of trials in order to see what a probability estimate and probability distributions look like. Support students to represent: • probability outcomes (theoretical and experimental) using lists, tables, tally charts, visualisations of distributions, words, and numbers • the chance of an outcome occurring using fractions, decimals, and percentages. **Connect** investigative questions to outcomes and with all possible ways to get the outcomes. **Connect** anticipated outcomes with theoretical and experimental distributions.
Critical thinking in probability	agree or disagree with others' conclusions about chance-based investigations.	evaluate others' statements about chance-based investigations, with justification.	identify, explain, and check others' statements about chance-based investigations, referring to evidence.	Show, with student input, how to: • match the results of chance-based investigations with statements, and check the claims of others' investigations • **explain** and **justify** the statements made by others about chance-based investigations, using interrogative questions.

Phase 3

Number

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Number structure	identify, read, write, compare, and order whole numbers using powers of 10 (e.g. 10,000 = 10^4) **NPC 5** NNS 1.5, 1.6 **NPC5** P&A 1.3 **NPC5** Calc 10.4, 10.5	identify, read, write, compare, and order whole numbers and decimals using powers of 10 (e.g., 0.01 = $\frac{1}{100}$ =10^{-2}) **NPC6** NNS 1, 2 **NPC6** Calc 5.1	**Represent** and order numbers using place-value (PV) expanders or charts and number lines.
	find the highest common factor (HCF) of two numbers under 100, and find the least common multiple (LCM) of two numbers under 10 **NPC5** P&A 3	use prime factorisation to represent a number and to find the HCF of two numbers **NPC6** P&A 1	**Represent** factors using factor trees, or systematic lists. **Connect** HCFs to simplifying fractions, and LCMs when renaming fractions. **Generalise** conjectures about prime or composite numbers by investigating factors.
	use exponents to represent repeated multiplication, and identify square roots of square numbers up to at least 100 **NPC5** P&A 4.4, 4.5, 4.6, 4.7, 5.7 **NPC6 NPC** Inv 1	identify and describe the properties of prime and composite numbers up to at least 100 and cube numbers up to at least 125 **NPC5** P&A 3.4, 3.6, 3.7, 4.7 **NPC6** P&A 1.2, 4.5	**Investigate** and **generalise** divisibility tests for composite and prime numbers, and **connect** the results to square and cube numbers and square roots. **Investigate** and **explain** patterns in repeated multiplication and **represent** them using exponent notation. **Connect** prime and composite numbers with factors, and **represent** a number as a product of its prime factors (prime factorisation).
Operations	use rounding and estimation to predict results and to check the reasonableness of calculations **NPC5** NNS 4.8 **NPC5** Calc 3.2, 3.3, 5.1, 5.3, 5.4	use rounding, estimation, and benchmarks to predict results and to check the reasonableness of calculations **NPC6** NNS 1.3 **NPC6** Calc 3	**Explain** efficient methods for supporting estimation (e.g., when adding a long list of numbers, look for numbers that can be grouped and summed to roughly 10, 100, 1000). **Connect** operations to benchmarks to make estimates (e.g., 73% is roughly $\frac{3}{4}$). **Explain** and **justify** findings, by **connecting** to estimates and other checking methods such as using the inverse operation.
	round whole numbers to any specified power of 10, and round decimals to the nearest tenth, hundredth, or whole number **NPC5** NNS 4 **NPC6** Calc 3	round whole numbers to any specified power of 10, and round decimals to the nearest tenth, hundredth, thousandth, or whole number **NPC5** NNS 4 **NPC6** Calc 3	
	recall multiplication facts to at least 10 × 10 and identify and describe the divisibility rules for 2, 3, 5, 9, and 10 **NPC4** Calc 5, 6 **NPC5** Calc 4.1 **NPC5** P&A 4.1, 6.2 **NPC6** P&A 4.5	identify and describe the divisibility rules for 2–11 **NPC6** P&A 4.5 **(covers divisibility by 2, 3, 5, 9, 10)** **Activity to follow**	**Investigate** patterns in multiples in 100s boards and multiplication charts to **generalise** divisibility rules.

Number continued

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Operations	multiply whole numbers **NPC5** Calc 4.5, 7.1, 7.3, 8.1, 8.2, 12		**Explain** and demonstrate efficient methods using worked examples, including: • the vertical-column method for division and multiplication, ensuring students understand and practise the procedure and **connect** with place value, known facts, and estimation • making estimates or mental calculations by **connecting** to place value, partitioning and known facts. **Investigate**, **explain**, and **justify** which method (including the use of digital tools) best suits a given situation. Have students practise decoding and solving word problems and representing them as equations. Represent and make sense of remainders as fractions, as decimals, and when rounded to the nearest whole number.
	divide whole numbers by one- or two-digit divisors (e.g., 327 ÷ 5 = 65.4 or 65 **NPC5** Calc 4.3, 4.6, 7.2, 7.3, 7.4, 7.5, 7.6, 8.4, 9.1, 9.2, 13 **NPC6** Calc 2.3, 2.5, 10 **NPC6** PFT 3.1	divide whole numbers (e.g., 327 ÷ 15 = 21.8 or 21 **NPC5** Calc 9, 13 **NPC6** Calc 2.3, 2.5, 10 **NPC6** PFT 3.1	
	use the order of operations **NPC6** Calc 6.3, 6.4, 6.5 **NPC6** PFT 3.5, 5.4	use the order of operations **NPC6** Calc 6.3, 6.4, 6.5 **NPC6** PFT 3.5, 5.4	Use worked examples to demonstrate a step-by-step layout with only one equal sign per line. Demonstrate how to use the mnemonic GEMA in relation to the order of operations: grouped, exponents, multiplicative (÷ and), additive (+ and –).
	order, compare, and locate integers on a number line, and explore adding and subtracting integers **NPC4** NNS 4 **NPC5** NNS 5	order, compare, add, and subtract integers **NPC6** Calc 1 **NPC6** PFT 3.6	**Generalise** that a positive number has an opposite negative number, and that when they are added, the answer is zero (e.g., 4 + –4 = 0). **Explain** how to: • find the number of steps between two given numbers on a number line (e.g., –5 and 7) • 'read' equations with integers on a number line (e.g., "To solve –9 + 8, start at –9 and move eight numbers in the positive direction.") • use inequality symbols to compare two integers (e.g., –5 < –3). **Investigate** adding and subtracting integers, using number lines and two-sided counters. **Explain** the direction of movement on a number line when adding and subtracting integers, and **generalise** that: • adding a negative number makes the original number smaller (e.g., 4 + –3 = 1) • subtracting a negative number makes the original number larger (e.g., –7 – (–3) = –4). **Investigate** situations where negative integers are used (e.g., temperature, altitude, debt, profit and loss).

Number continued

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Rational numbers	identify, read, write, and represent fractions, decimals (to three places), and percentages **NPC5** NNS 3.2, 3.3, 3.4, 3.5, 3.6, 7.1 **NPC5** Calc 11.1, 11.2 **NPC6** NNS 1.4, 2 **NPC6** Calc 5.1	identify, read, write, and represent fractions, decimals, and percentages **NPC6** NNS 1.4, 2 **NPC6** Calc 5.1	**Explain** and **represent**: • percentages using 100s squares • comparing or ordering fractions, decimals, and percentages using double number lines • decimals or percentages as fractions with denominators of tenths or hundredths, and then renamed to their simplest form • fractions in equivalent forms to support comparing, ordering, and converting. **Explain** and demonstrate converting a fraction to a decimal or percentage by **connecting** to the understanding of fractions as quotients (e.g., $\frac{7}{12} = 5 \div 12$). **Connect** to known benchmarks when comparing and converting (e.g., $\frac{7}{12}$ is a little more than $\frac{6}{12}$, which is a half or 50%).
	compare, order, and convert between fractions, decimals (to three places), and percentages **NPC5** NNS 3.7, 3.8, 6.1, 6.2, 6.3, 7.4 **NPC5** Calc 11.5, 11.6	compare, order, and convert between fractions, decimals, and percentages **NPC6** NNS 2.1, 2.2, 2.4 **NPC6** Calc 5.1, 5.2, 8.1, 8.2, 8.3, 8.4 **NPC6** PFT 4.4	
	multiply and divide numbers by 10, 100, and 1,000 **PC5** Calc 7 **NPC6** Calc 2.4	multiply and divide numbers by powers of 10 **NPC5** Calc 7 **NPC6** Calc 2.4	**Represent** decimals using PV expanders or charts, and **generalise** that multiplying by a power of 10 moves each digit that number of places to the left, and dividing by a power of 10 moves each digit that number of places to the right.
	find equivalent fractions, simplify fractions, and convert between improper fractions and mixed numbers **NPC5** NNS 2.1, 2.2, 2.3, 2.4, 2.5, 2.7, 6.4, 6.5 **NPC6** NNS 2.3	find equivalent fractions, simplify fractions, and convert between improper fractions and mixed numbers **NPC5** NNS 2.1, 2.2, 2.3, 2.4, 2.5, 2.7, 6.4, 6.5 **NPC6** NNS 2.3	**Explain** simplifying fractions and finding equivalent fractions by using HCFs and LCMs.
	multiply fractions and decimals by whole numbers **NPC5** Calc 4.8, 7.4, 7.5, 7.6, 12.3, 15.5, 15.6 **NPC5** NNS 7.1, 7.2, 7.3	multiply fractions and decimals by whole numbers **NPC5** Calc 4.8, 7.4, 7.5, 7.6, 12.3, 15.5, 15.6 **NPC5** NNS 7.1, 7.2, 7.3 **NPC6** Calc 9.2, 9.4	**Explain** the vertical column method for multiplying decimals, making an estimate before calculating. **Connect** to the multiplicative identity to **generalise** that multiplying a whole number by a decimal less than one results in a product less than the original whole number.
	find a percentage of a whole number, and find a whole amount, given a simple fraction or percentage (e.g., "25% is $100, what is the total amount?") **NPC5** NNS 7 **NPC5** Calc 4.8, 7.4, 7.5, 7.6, 11.5, 12.3, 15.5, 15.6 **NPC6** Calc 5.3, 5.4, 5.5, 9.2, 12	find a percentage of a whole number, and find a whole amount, given a simple fraction or percentage (e.g., "75% is $45, what is the total amount?") **NPC5 Calc 4.8, 7.4 – 7.6, 11.5, 12.3, 15.5 – 15.6** **NPC5 NNS 7.1 – 7.3** Calc 5.3, 5.4, 5.5, 9.2, 12	**Represent** situations involving percentages using bar models to show parts of a whole. **Explain** how to find a percentage of a whole by using the decimal equivalent to multiply the whole (e.g., 35% of 120 = 0.35 x 120) or by finding 10%, 5% or 1% of the whole and using operations (e.g., finding 35% of 120 by finding 10%, multiplying this by 3 to get 30%, then adding half of 10% – 12 x 3 + 6 = 42).

Number continued

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Rational numbers	add and subtract fractions with different denominators of up to a tenth, using equivalent fractions (e.g., $\frac{1}{3} + \frac{1}{3}$) **NPC5** Calc 15.4 **NPC6 Calc** 11.2, 11.4, 11.5	add and subtract fractions with different denominators, using equivalent fractions **NPC5** Calc 15.4 **NPC6** Calc 11.4, 11.5 **NPC6** PFT 4.2	Demonstrate and **explain** renaming fractions, using ideas about equivalence and by finding HCFs and LCMs.
	add and subtract decimals to three decimal places, with an emphasis on estimating before calculating **NPC5** Calc 1.2, 1.3, 1.5, **1.6, 2.5, 2.6,** 3.4, 3.5, 3.6, 5.4, 6.3, 6.4, 6.5	add, subtract, and multiply decimals, with an emphasis on estimating before calculating **NPC5** Calc 1.2, 1.3, 1.5, **1.6, 2.5, 2.6,** 3.4, 3.5, 3.6, 5.4, 6.3, 6.4, 6.5, 5.5, 6.3, 6.4, 6.5, 7.4, 7.5, 7.6, 8.3, 12.3 **NPC6** Calc 2.4, 4.1, 4.2, 4.4, 9.2, 9.4 **NPC6** PFT 4.1	**Connect** methods for operating on whole numbers with operating on decimals, making an estimate before calculating. **Investigate** situations where decimals are compared and the differences between them found (e.g.,. sporting event times and distances). Have students practise decoding and solving word problems and **representing** them as equations.
	use proportional reasoning to explore multiplicative relationships between quantities (e.g., "If there are 3 red for every 7 blue balls, how many balls are there altogether when there are 18 red balls?") **NPC5** Calc 10	use proportional reasoning to share with unequal proportions (e.g., "We have 100 stickers to share. For every 1 sticker I get, you get 3. How many do we each get?") **NPC6** Calc 7	**Investigate** proportional reasoning in situations such as mixing paints, cooking from recipes, and sharing resources. **Represent** situations involving proportional reasoning using diagrams and comparison bar models. **Connect** proportional reasoning to multiplicative thinking and equivalent fractions.
Financial mathematics	calculate total cost and change for any amount of money **NPC5** P&A 2.5 **NPC5** NNS 4.6 **NPC5** Calc 1.2, 1.5, 3.3, 3.5, 3.6, 5.4, 6.3, 8.5, 13.5, 14.3, 16.1, 16.4	create and compare weekly, monthly, and yearly finance plans (e.g., saving plans, phone plans, budgets, and 'buy now, pay later' services) **NPC6** Calc 6.1 **NPC6** Inv 5, 6 **GMS6** Inv 2.1, 2.3, 3.2	**Explain** and **justify** 'best deals', considering personal priorities. Represent financial plans for practical situations using digital tools such as spreadsheets. **Investigate** situations where there are financial percentage losses or gains (e.g., calculating discounts or profits, statistics in the media about growth or decline). **Connect** the ideas of loss and debt with integers. **Explain,** using worked examples, finding a percentage discount by subtracting from the whole or by multiplying the whole by a decimal fraction (e.g., a 35% discount on $180 = $180 – (0.35 x $180), or 0.65 x $180).
	apply percentage discounts to whole-dollar amounts **NPC5** NNS 7.1, 7.4, 7.5 **NPC5** Calc 11.4, 11.5	apply percentage discounts **NPC6** Calc 5.1, 13.2	

Algebra

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Equations and relationships	form and solve one-step linear equations (e.g., t + 7 = 12, 2s = 14) **NPC6** P&A 2, 3, 4.1, 4.2, 4.3, 4.4	form and solve one- or two-step linear equations (e.g., 5s + 3 = 18) **NPC6** P&A 2, 3, 4.1, 4.2, 4.3, 4.4	Have students practise writing equations to **represent** word problems. Demonstrate solving one- or two-step equations and using the inverse operation to check findings.
	find the value of an expression or formula, given the values of variables (e.g., "Calculate w + 12 when w = 4") **Activity to follow**	find the value of an expression or formula, given the values of variables **Activity to follow**	**Investigate** variable values in practical situations with familiar formulae (e.g., for area, volume, speed). Have students practise substituting measurements or given values into formulae.
	describe and use the commutative, distributive, and associative properties of operations (e.g., a x b = b x a) **Commutative: NPC2** Calc 1.4, **NPC5** Calc 4.1 **Associative: NPC3** Calc 6.5, **NPC4** P&A 3.8 **NPC6 Calc 2.1, 2.2** **Distributive: NPC4** Calc 10.3, 10.4, **NPC5** Calc 8.1, 8.2, 8.3, 8.5, **NPC6** Calc 2.2, 2.3	simplify algebraic expressions involving sums, products, differences, and single brackets (e.g., using the distributive property, 2(x + 3) + 1 = 2x + 6 + 1 = 2x + 7) **NPC6** P&A 3.4, 3.5 **Activity to follow**	**Represent** terms in algebraic expressions using algebra tiles. Represent algebraic expressions and equations using the conventions of algebra (e.g., 3 x b or b x 3 is written as 3b). At year 8, **explain** how to simplify algebraic expressions by collecting like terms together. At year 8, **investigate** systematic expansion approaches, including expansion tables, **connecting** to the distributive property.
	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 **NPC5** P&A 5 **NPC6** P&A 2, 3, 4 **Activity to follow**	determine if a pattern is linear and, if it is, write the equation for the pattern and use the equation to make conjectures **NPC6** P&A 2, 3, 4	**Represent** a pattern using a table, model, or diagram, and use it to **generalise** a rule for the pattern. Use the rule and an XY graph to **justify** a conjecture for another term in the pattern. **Investigate** the history, meaning, and structure of growing patterns (e.g., tukutuku, other well-known patterns such as the Fibonacci sequence).
Algorithmic thinking	create, test, and revise algorithms involving a sequence of steps and decisions **NPC5** P&A 2.6, 2.7, 5.5, 6.4, 6.5 **NPC5** Calc 1.6	create, test, revise, and use algorithms to identify, interpret, and explain patterns. **NPC6** P&A 3.3, 3.4, 3.5, 4.1, 4.2 **NPC6** Calc 4.4, 9.5 **NPC6** PFT 3.3, 3.4, 4.1	**Connect** an algorithm with an operation such as the vertical-column method for multiplication or with the procedure for adding fractions. **Represent** algorithms using flow charts, numbered step-by-step instructions, or digital tools. Explore algorithms **by investigating**: • the formula function of a spreadsheet and the effect of changing the value of a variable in a formula (e.g., hourly wages) • sorting and filtering multivariate data • sorting numbers according to a set of instructions (e.g., the sieve of Eratosthenes) to find prime numbers • situations that can be described and tested (e.g., divisibility, the use of transformations in a shape pattern, converting between units of measurement) • creating, testing, and revising a set of instructions using a digital tool.

Measurement

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Measuring	estimate and then measure length, area, volume, capacity, mass (weight), temperature, data storage, time, and angle, using appropriate units **GMS2** Mea 6.4 **GMS3** Mea 1.4, 3.3, 5.1, 5.5, 6.1 **GMS4** Mea 1.1, 3.1, 3.2, 3.3, 4.3 **GMS5** Geo 1, Mea 1.1, 4.4, 4.5 **Activity to follow**	estimate and then measure length, area, volume, capacity, mass (weight), temperature, data storage, time, and angle, using appropriate units **GMS2** Mea 6.4 **GMS3** Mea 1.4, 3.3, 5.1, 5.5, 6.1 **GMS4** Mea 1.1, 3.1, 3.2, 3.3, 4.3 **GMS5** Geo 1, Mea 1.1, 4.4, 4.5 **GMS6** Mea 4 **Activity to follow**	**Connect** to benchmarks to make estimations. Have students practise the accurate use of rulers, scales, timers, protractors, thermometers, and measuring jugs in practical situations. **Represent** all written measurements with their units. Select appropriate tools and units for a situation, and **explain** and **justify** choices.
	select and use an appropriate base measure (e.g., metre, gram, litre) within the metric system, along with a prefix (e.g., kilo-, centi-) to show the size of units **GMS3** Mea 3, 5, 6 **GMS4** Mea 3, 4, 5 **GMS5** Mea 1.1, 3, 4, 5, 6, 7	select and use an appropriate base measure within the metric system, along with a prefix to show the size of units **GMS3** Mea 3, 5, 6 **GMS4** Mea 3, 4, 5 **GMS5** Mea 1.1, 3, 4, 5, 6, 7	
	convert between metric units of length, mass (weight), and capacity, using whole numbers and decimals to express parts of a unit (e.g., 724 g = 0.724 kg) **GMS4** Mea 3.2, 3.3, 3.4, 3.6, 4, 5 **GMS5** Mea 1.1, 4.4, 4.5, 4.6, 7.5	convert between metric measurement units, including square units **GMS4** Mea 3.2, 3.3, 3.4, 3.6, 4, 5 **GMS5** Mea 1.1, 4.4, 4.5, 4.6, 7.5 **Activity to follow**	**Connect** measurement conversions with multiplying and dividing by powers of 10 (e.g., 2.05 L = 2050 mL). **Investigate** measurement conversion situations in which all four operations are applied to whole-number and decimal measures.
	find speed, given distance and time **GMS6** Mea 1.3, 1.4	find distance, given speed and time; or time, given distance and speed **GMS6** Mea 1.3, 1.4	**Investigate** the relationship between speed, distance, and time in practical situations, such as timing how long it takes to walk or run a certain distance. Have students practise substituting values into the speed formula. **Connect** finding the value of variables in the speed formula with solving algebraic equations and multiplication and division operations.
	• read, interpret, and use timetables and charts that present information about duration • convert between units of time, and solve duration problems that involve fractions of time **GMS5** Mea 2.2, 2.4, 2.5 **GMS5** Mea 7.2	• read, interpret, and use timetables, charts, and results that present information about duration • convert times to a common unit, such as seconds or minutes, and use decimal units of time (milliseconds) **EXTEND GMS4** Mea 1 **GMS5** Mea 2.2, 2.4, 2.5 **Activity to follow**	**Explain** how to plan journeys using timetables and charts. Draw on a range of examples, including digital tools. **Explain** methods of calculating duration (e.g., subtracting time), using worked examples. **Investigate** the use of decimal units (milliseconds) in situations where a more precise measurement is needed (e.g., sporting events).

Measurement continued

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Perimeter, area, and volume	calculate the perimeter and area of composite shapes composed of triangles and rectangles. **GMS4** Mea 6.2, 6.3, 6.4, 6.5, 6.6 **GMS5** Mea 3.4 **GMS6** Mea 2.1, 2.4, 2.5	calculate the volume of triangular prisms and shapes composed of rectangular prisms. **GMS4** Mea 6.2, 6.3, 6.4, 6.5, 6.6 **GMS5** Mea 3.4 **GMS6** Mea 2.1, 2.4, 2.5	**Investigate** perimeter, area and volume, including finding missing lengths, in practical situations. **Connect** calculations with factors, multiples, and the commutative and associative properties. **Represent** working for calculations using a clear layout and by sketching composite shapes to show partitioning. **Generalise** the formulae for finding the area of triangles and volume of triangular prisms, and have students practise substituting measurement values into them. **Connect** the formulae with spatial representations.

Geometry

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Shapes	classify and name shapes based on their attributes (e.g. triangles, pyramids) **GMS3** Geo 3 **GMS4** Geo 1	describe triangles, quadrilaterals, and other polygons in relation to their sides, diagonals, and angles GMS6 Geo 1	Use and create a range of 2D and 3D shapes, including shapes that draw on tactile materials, diagrams, and digital tools. **Investigate** ways of classifying shapes, including by creating algorithms, and using Venn diagrams and tables.
	identify and describe angles at a point, angles on a straight line, and vertically opposite angles **GMS5** Geo 1.5, 3.1, 3.2 **GMS6** Geo 1.5	reason about unknown angles in situations involving angles at a point, angles on a straight line, vertically opposite angles, and interior angles of triangles and quadrilaterals **GMS5** Geo 3.1, 3.2 **GMS6** Geo 1.5	**Investigate** using digital tools and protractors to explore angles. **Investigate** unknown angles to **generalise** the following rules: • the sum of the angles round a point is 360° • the sum of the angles on a straight line is 180° • vertically opposite angles are equal • the sum of the interior angles of a triangle is 180° and of a quadrilateral is 360°. **Represent** the value of an unknown angle using an equation and angle notation.
Spatial reasoning	visualise, construct, and draw plan views for front, back, left, right, and top views of 3D shapes **GMS5** Mea 4.2, 4.3, 6.2 **GMS6** Mea 3, 4.1	visualise and draw nets for prisms with a fixed cross section **GMS6** Mea 3	**Represent** plan views and nets, using sketches on grid paper, digital tools, and physical models (e.g., blocks, cardboard nets). **Connect** to measurement procedures when creating sketches and models.
	transform 2D shapes, including composite shapes, by resizing by a whole number or unit fraction **GMS5** Mea 6 **paired/individual work 4** **Activity to follow**	recognise the invariant properties of 2D and 3D shapes under different transformations **Activity to follow**	**Explain** and demonstrate resizing a shape using a centre of enlargement within the shape. **Investigate** transforming shapes to **generalise** which properties (angles, side lengths, area, orientation) do not change under transformation, and test the resulting generalisations using tracing paper, rulers, and protractors. **Investigate** the meaning of kōwhaiwhai patterns and other artefacts, and describe the use of transformations in them.
Pathways	interpret and communicate the location of positions and pathways using coordinates, angle measures, and the 8 main and halfway compass points (e.g., NE, which is 45° E from N). **GMS4** Geo 4 **Activity to follow**	use map scales, compass points, distance, and turn to interpret and communicate positions and pathways in coordinate systems and grid reference systems. **GMS4** Geo 4 **GMS5** Geo 1.3, 1.4, Mea 6.3 **Activity to follow**	Use maps of familiar and unfamiliar locations to: • **explain** and **investigate** the use of 4-digit grid references • calculate distances using scales • find efficient routes between destinations. **Connect** pathways to: • measurement procedures when finding angles and distances • proportional reasoning when using map scales • algorithms to describe routes between two points. **Investigate** the navigating techniques of Māori and Pacific voyagers for locating position and finding the direction of travel.

Statistics: New Statistics and Probability content to follow soon

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Problem	investigate, using multivariate datasets, summary, comparison, time-series, and relationship situations for paired categorical data by: • posing an investigative question about a local community matter • making conjectures or assertions about expected findings	investigate, using multivariate datasets, summary, comparison, time-series, and relationship situations by: • posing an investigative question about a local community matter • making conjectures or assertions about expected findings	Show, with student input, how to pose **investigative** questions, clearly identifying the variable, group of interest, and the intent. **Connect** investigative questions with conjectures about expected findings.
Plan	plan how to collect or source data to answer the investigative question, including: • determining or identifying the variables needed • planning how to collect data for each variable (e.g., how to measure it) or finding out how provided data was collected • identifying the group of interest or who the data was collected from • building awareness of ethical practices in data collection by strategic questioning of data-collection questions or methods		**Explain** and discuss ethical practices for the collection and use of data. **Represent** planning using a planning tool to outline methods of data collection, 'who' and what to measure, and how. Show, with student input, how to pose data-collection and survey questions. **Explain** the variables and group or groups of interest in secondary datasets. **Investigate** how survey and data collection questions can be misinterpreted, leading to unreliable data.
Data	collect primary data or gather information about variables in sourced data, create a simple informal data dictionary, and check for errors	collect or source data, including: • checking for errors and following up and correcting them when possible • creating an informal data dictionary with information that will help others know about the context	Show, with student input: • a range of data-collection and recording methods • how to identify errors in data, **connecting** to the context, and **explaining** why they are errors • how to update primary data when correctable errors are found. **Connect** multiple variables for individuals, **explaining** that most datasets use a spreadsheet table design in which each row focuses on an individual and each column includes the data on multiple individuals for one variable.

Statistics: New Statistics and Probability content to follow soon (cont...)

	During year 7 Informed by prior learning, teach students to:	**During year 8** Informed by prior learning, teach students to:	**Teaching considerations**
Analysis	• create data visualisations for the investigation • make statements about the data, including its features and context, in descriptions of distributions	• create data visualisations for the investigation, using multiple visualisations to provide different views of the data • make statements about the data, including its features and context, in descriptions of distributions	Show, with student input, how to: • **represent** data using dot plots, bar graphs, frequency tables, time-series graphs, two-way tables or graphs, scatter plots, fractions, proportions, and percentages**,** creating them at first by hand and then with digital tools • read the data, read 'between' the data, and read 'behind' the data • describe what is seen in the data visualisations, recognising that data are numbers with context, and the context includes variables of interest, groups of interest, counts or proportions for categorical variables, and values and units for numerical variables • compare data visualisations of the same variable for different groups by looking at similarities and differences. **Explain** how different data visualisations have different features and how to describe them in context (e.g., in relation to the middle, distributional shape, joint and conditional proportions, and long-term trends).
Conclusion	communicate findings in context to answer the investigative question, using evidence from analysis and comparing findings to initial conjectures or assertions and their existing knowledge of the world	communicate findings in context to answer the investigative question, using evidence from analysis, considering possible explanations for findings, and comparing findings to initial conjectures or assertions and their existing knowledge of the world.	Show, with student input, how to: • choose the best descriptive statements that answer an investigative question • explore explanations or interpretations of findings that **connect** to the context of the situation under investigation • prepare and present succinct findings • **explain** and **justify** whether or not findings align with initial conjectures or assertions, and if what was found makes sense given what is known about the situation.
Statistical literacy	evaluate the findings of others to check if their claims or statements are supported by the data visualisations they use.	evaluate the data-collection methods, data visualisations, and findings of others' statistical investigations to see if their claims are reasonable.	Show, with student input, how to: • identify misleading data visualisations, match others' data visualisations with their statements, and check the claims made by others • **explain** and **justify** others' statements about the findings of statistical investigations and the process for collecting data, using interrogative questions.

Probability: New Statistics and Probability content to follow soon.

	During year 7 Informed by prior learning, teach students to:	During year 8 Informed by prior learning, teach students to:	Teaching considerations
Probability investigations	plan and conduct probability experiments for chance-based situations, including undertaking a large number of trials using digital tools, by: • posing an investigative question • anticipating what outcomes are possible and which of them are more or less likely to occur • identifying and systematically listing possible answers to the investigative question • collecting and recording data • creating data visualisations for the distribution of observed outcomes • describing what these visualisations show • finding the probability estimates for the different outcomes • answering the investigative question • identifying similarities and differences between their findings and those of others • reflecting on anticipated outcomes • comparing findings from the probability experiment and associated theoretical probabilities, as appropriate	plan and conduct probability experiments for chance-based situations, including undertaking a large number of trials using digital tools, by: • posing an investigative question • anticipating what outcomes are possible and which of them are more or less likely to occur • identifying and systematically listing possible answers to the investigative question • collecting and recording data • creating data visualisations for the distribution of observed outcomes and for all possible outcomes for theoretical probability models, where they exist • describing what these visualisations show • finding the probability estimates for the different outcomes • proposing possible theoretical outcomes and associated probabilities, for situations where no theoretical model exists • answering the investigative question • identifying similarities and differences between their findings and those of others • reflecting on anticipated outcomes • identifying similarities and differences between findings from the probability experiment and associated theoretical probabilities, as appropriate	**Investigate**, using the statistical enquiry cycle, games of chance, other everyday chance-based situations, patterns in possible outcomes, and theoretical and experimental distributions. **Represent** probability outcomes (theoretical and experimental) using lists, tables, tree diagrams, tally charts, visualisations of distributions, words, numbers, and technology. **Explain** how to describe and use probability concepts (e.g., outcomes, events, trials, models; theoretical and experimental probability; with and without replacement; the law of large numbers; probability estimates, probability distributions; chance, randomness, and variation). **Connect** anticipated outcomes with theoretical and experimental distributions. **Connect** probabilities with proportional reasoning, fractions, and percentages, and with relative frequencies from data investigations.
Critical thinking in probability	identify, explain, and check others' statements about chance-based investigations, referring to evidence		Show, with student input, how to: • match the results of others' chance-based investigations with statements • **explain** and **justify** the statements made by others about their findings from chance-based investigations, using interrogative questions.