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|  | **Domain** |
| **Transition** |  **Addition and Subtraction**  |  **Multiplication and Division**  |  **Fractions, Proportions and Ratios**  |  **Algebra**  |
| Stage 0-1 | [AddPlanner E-CA](#s0to2i2kyrmw) |   |   |   |
| Stage 1-3 | [AddPlanner CA](#l99ys4fvjpn0) |   | [FracPlanner CA](#u9u75bye9ytq) |   |
| Stage 3-4 | [AddPlanner CA-AC](#w5zcpvuyhga7)  | [MultPlanner CA-AC](#tlsjh6ipa56e) | [FracPlanner CA-AC](#3jl553yjc6qh) |   |
| Stage 4-5 | [AddPlanner AC-EA](#hyib516d1vn1)  | [MultPlanner AC-EA](#o4f7905ume1f) | [FracPlanner AC-EA](#uya0cvlg0a85)  |   |
| Stage 5-6 | [AddPlanner EA-AA](#v1udnwdls1w4)  | [MultPlanner EA-AA](#mvo0r9i8oqdd) | [FracPlanner EA-AA](#42v3qv7twxld)  | [AlgPlanner EA-AA](#d6smkg1fpoak)  |
| Stage 6-7 | [AddPlanner AA-AM](#5yc26qxsiaek)  | [MultPlanner AA-AM](#hvj4hjopxtz)  | [FracPlanner AA-AM](#4a6w0x86c1wl)  | [AlgPlanner AA-AM](#8wp8f16jdwbd) |
| Stage 7-8 |   | [MultPlanner AM-AP](#67yd6iymtj3x)  | [FracPlanner AM-AP](#a78l5icv42e5) | [AlgPlanner AM-AP](#u4vp3q4hznpq) |

***Transition: Emergent to One to One Counting (CA) Domain: Addition and Subtraction***

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| **Key Teaching Ideas** | **References**  |
| Symbols/words for numbers in the range 1-10 are identified(Key Idea #1) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[Lucky Dip](https://nzmaths.co.nz/node/873) (11)[Number Mat and Lily Pads](https://nzmaths.co.nz/node/1036) (11)[Pipe Cleaner Numbers](https://nzmaths.co.nz/node/1037) (11) |
| The symbols/words for numbers in the range 1-10 are matched to the number of objects in the set.(Key Idea #3) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Match it Up***](https://nzmaths.co.nz/node/853) ***(13)***[***Caterpillar Legs***](https://nzmaths.co.nz/node/851) ***(13)***[***Petals and Flower Centres***](https://nzmaths.co.nz/node/862) ***(14)***[***Feed the Elephants***](https://nzmaths.co.nz/node/855) ***(14)***[***Birthday Cakes***](https://nzmaths.co.nz/node/860) ***(14)*** |
| The sequence of numbers in the range 1-10 is ordered correctly(Key Idea #4) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Before and After***](https://nzmaths.co.nz/node/887) ***(14)***[***Ordering Numerals***](https://nzmaths.co.nz/node/879) ***(15)***[***Up or Down***](https://nzmaths.co.nz/node/886) ***(15)***[***How Many Beans***](https://nzmaths.co.nz/node/25695) ***(15)*** |
| Patterns for numbers 1-5 are recognised instantly(Key Idea #5) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Patterns to Five, then Ten***](https://nzmaths.co.nz/node/25698) ***(15)***[***Fabulous Fives***](https://nzmaths.co.nz/node/1075) ***(16)*** |

***Transition: Moving from One-to-one Counting to Counting from One on Materials Domain: Addition and Subtraction***

***and by Imaging***

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| **Key Teaching Ideas** | **References**  |
| The number of objects in the set stays the same, regardless of spatial arrangement(Key Idea #1) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[Animals on the Farm](https://nzmaths.co.nz/node/25699) (18)   |
| Addition and subtraction problems that involve numbers up to five can be solved by physically counting all the objects from one or mentally counting the objects(Key Idea #2) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[Adding and Subtracting with One Hand](https://nzmaths.co.nz/node/880) (19)  |
| Addition and subtraction problems that involve five as one of the numbers can be solved by physically counting all the objects from one or mentally counting the objects(Key Idea #3) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Murtles 5 and…***](https://nzmaths.co.nz/node/877) ***(21)***[***Fly Flip***](https://nzmaths.co.nz/node/1034) ***(21)***[***Using Fives***](https://nzmaths.co.nz/node/878) ***(22)*** |
| Addition and subtraction problems that involve numbers up to ten can be solved by physically counting all the objects from one or mentally counting the objects(Key Idea #4) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Adding and subtracting with counters or hands***](https://nzmaths.co.nz/node/874) ***(23)*** |
| Addition and subtraction problems that involve ten as one of the numbers can be solved by physically counting all the objects from one or mentally counting the objects(Key Idea #5) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Making Tens***](https://nzmaths.co.nz/node/891) ***(25)*** |
| Place value is developed by connecting physical models, words, and symbols(Key Idea #6) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Read Say Do: 10-19***](https://nzmaths.co.nz/node/25701) ***(26)*** |

***Transition: Moving from One-to-one Counting to Counting from One on Materials Domain: Fractions, Proportions and Ratios***

***and by Imaging***

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| **Key Teaching Ideas** | **References**  |
| Find by practical means halves and quarters of shapes and objects e.g. half a glass of water  Find halves and quarters of sets of objects to 20 by equal sharing of objects    | ***Teaching Fractions, Decimals and Percentages (Book 7)*** [Fair Shares](https://nzmaths.co.nz/node/906) (11-14)  |

***Transition: Counting All to Advanced Counting Domain: Addition and Subtraction***

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| **Key Teaching Ideas** | **References**  |
| Numbers can be added by counting on from the largest number in increments of one.(Key Idea #1) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[Number Tiles](https://nzmaths.co.nz/node/895) (29)[The Number Strip](https://nzmaths.co.nz/node/893) (30)[The Bears’ Picnic](https://nzmaths.co.nz/node/896) (31)[Change Unknown](https://nzmaths.co.nz/node/897) (31) |
| Numbers can be subtracted by counting back from the largest number in increments of one.(Key Idea #2) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Counting Back***](https://nzmaths.co.nz/node/898) ***(32)*** |
| Objects can be counted by creating bundles of ten.(Key Idea #3)  | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Ones and Tens***](https://nzmaths.co.nz/node/1103) ***(33)*** |
| Groups of ten can be added and subtracted by using simple addition facts(Key Idea #4) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***Ten Stickers Per Packet***](https://nzmaths.co.nz/node/25703) ***(34)***[***Adding Tens***](https://nzmaths.co.nz/node/899) ***(35)***[***Subtracting Tens***](https://nzmaths.co.nz/node/903) ***(35)*** |
| Addition is commutative, so the order of the numbers can be rearranged to make counting on easier(Key Idea #5) | ***Teaching Addition, Subtraction, and Place Value (Book 5)***[***The Bigger Number First***](https://nzmaths.co.nz/node/892) ***(36)*** |

***Transition: Counting All to Advanced Counting Domain: Multiplication and Division***

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| **Key Teaching Ideas** | **References**  |
| Solve multiplication problems using skip counting in twos, fives, and tens. | ***Teaching Multiplication and Division (Book6)***Introduction (7-8)[Number Strips](https://nzmaths.co.nz/node/885) (8-10)  |
| Solve division problems by equal sharing in ones, twos and fives. | ***Teaching Multiplication and Division (Book 6)***[Twos, Fives, and Tens](https://nzmaths.co.nz/node/926) (21-23) |

***Transition: Counting All to Advanced Counting Domain: Proportions and Ratios***

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| **Key Teaching Ideas** | **References**  |
| Find simple fractions of shapes and lengths starting with halves and quarters, then moving to thirds, fifths and tenths | ***Teaching Fractions, Decimals and Percentages (Book 7)***[Fair Shares](https://nzmaths.co.nz/node/906) (11-14) ***Figure It Out***N 2.2 (6) [It’s a Magic Mish-mash](https://nzmaths.co.nz/node/3082) |
| Find a fraction of a number by sharing out the objects equally, moving towards anticipating the sharing by imaging or skip-counting.Emphasis on halves, quarters, eighths, thirds and fifths.  | ***As for previous strategy outcome.******Teaching Fractions, Decimals and Percentages (Book 7)******Introduction (4-10)***[***Fair Shares***](https://nzmaths.co.nz/node/906) ***(11-14)*** |

***Transition: Advanced Counting to Early Additive Domain: Addition and Subtraction***

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| **Key Teaching Ideas** | **References**  |
| Our number system is based on ten.(Key Idea #1) Basic fact knowledge can be used to add and subtract tens.(Key Idea #2)    | **T*eaching Addition and Subtraction (Book 5)***[More Ones and Tens](https://nzmaths.co.nz/node/901) (38)[Adding Ones and Tens](https://nzmaths.co.nz/node/904) (38)[Subtracting Ones and Tens](https://nzmaths.co.nz/node/902) (39)***Figure It Out***N2.1 [Shaker Makers](https://nzmaths.co.nz/node/3054) (4)N2.1 [How Old?](https://nzmaths.co.nz/node/3055) (5)N2.1 [Mighty Marty!](https://nzmaths.co.nz/node/3056) (6)N2.2 [Hunting the Taniwha](https://nzmaths.co.nz/node/3083) (7)N2.2 [Leapfrog](https://nzmaths.co.nz/node/3087) (12)N2-3 [Putting Numbers to Work](https://nzmaths.co.nz/node/3103) (2)N2-3 [Going Up](https://nzmaths.co.nz/node/3118) (8)N3-4.1 [Disappearing Dollars](https://nzmaths.co.nz/node/3271) (24)N7/8 l.1 [Down with Darts](https://nzmaths.co.nz/node/3362) (18)N7/8 L.1 [Absolutely Abseiling](https://nzmaths.co.nz/node/3363) (19) |
| Numbers can be rearranged and combined to make ten.(Key Idea #3) Addition is associative, so addends can be re-grouped to solve a problem more efficiently.(Key Idea #6) | ***Teaching Addition and Subtraction (Book 5)***[**Make Ten**](https://nzmaths.co.nz/node/908) **(working with ten) (40)**[**Compatible Numbers**](https://nzmaths.co.nz/node/909) **(44)** |
| Addition and subtraction problems can be solved by partitioning one of the numbers to go up or back through ten.(Key Idea #4) Subtraction problems can be solved by going back through ten, partitioning numbers rather than counting back(Key Idea #5) | ***Teaching Addition and Subtraction (Book 5)***[**Adding in Parts**](https://nzmaths.co.nz/node/913) **(working through ten) (41)**[**Subtraction in Parts**](https://nzmaths.co.nz/node/915) **(subtracting back through ten) (42)*****Figure It Out*****N2.2** [**Counting Counts**](https://nzmaths.co.nz/node/3085) **(10)****N2.2** [**On and Off the Train**](https://nzmaths.co.nz/node/3089) **(14)****NS&AT2-3.2** [**Make 28**](https://nzmaths.co.nz/node/4058) **(14)****BF3** [**Animal Antics**](https://nzmaths.co.nz/node/2880) **(1)****BF3** [**Carrot Country**](https://nzmaths.co.nz/node/2884) **(6)****BF3-4** [**Diamond Dazzle**](https://nzmaths.co.nz/node/2906) **(4)****BF3-4** [**Bunches**](https://nzmaths.co.nz/node/2903) **(1)****BF3-4** [**Magical Tens**](https://nzmaths.co.nz/node/2912) **(11)****BF3-4** [**Face Totals**](https://nzmaths.co.nz/node/2925) **(18)****N7/8 L.1** [**King of the Castle**](https://nzmaths.co.nz/node/3360) **(15)** |
| Change unknown problems can be solved by using place-value knowledge of tens and ones or by partitioning through tens.(Key Idea #7) | ***Teaching Addition and Subtraction (Book 5)***[***Up Over Ten***](https://nzmaths.co.nz/node/910) ***(change unknown working through ten) (45)***[***The missing ones and tens***](https://nzmaths.co.nz/node/916) ***(46)***[***Problems like 37 + o = 79***](https://nzmaths.co.nz/node/929) ***(change unknown with tens) (46)******[Problems like 67 - o = 34](https://nzmaths.co.nz/node/939)*** |
| Subtraction can be used to solve difference problems in which two amounts are being compared.(Key Idea #8) | ***Teaching Addition and Subtraction (Book 5)***[***Comparisons: Finding Difference in Data***](https://nzmaths.co.nz/node/25708) ***(48)***[***More comparisons: Comparing Heights***](https://nzmaths.co.nz/node/911) ***(49)*** |
| Knowledge of doubles can be used to work out problems close to a double.(Key Idea #9) | ***Teaching Addition and Subtraction (Book 5)***[***Near Doubles***](https://nzmaths.co.nz/node/937) ***(49)******Figure It Out******N2.1*** [***Helping Hands***](https://nzmaths.co.nz/node/3053) ***(3)******N2.2*** [***It’s Not Fair***](https://nzmaths.co.nz/node/3090) ***(15)******BF2.3*** [***Fizzing It Up***](https://nzmaths.co.nz/node/2858) ***(5)*** |
| The equals sign represents balance.(Key Idea #10) | ***Teaching Addition and Subtraction (Book 5)***[***A Balancing Act***](https://nzmaths.co.nz/node/1104) ***(50)*** |
| Round three-digit whole numbers to the nearest 10, or hundred |  |
| Recall the multiples of 100 that add to 1000, e.g. 400 and 600. |  |

***Transition: Advanced Counting to Early Additive Domain: Multiplication and Division***

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| **Key Teaching Ideas** | **References**  |
| Solve multiplication problems using repeated addition | ***Teaching Multiplication and Division (Book 6)***Introduction (11-12)[Three’s Company](https://nzmaths.co.nz/node/1024) (12-14)[Animal Arrays](https://nzmaths.co.nz/node/919) (15-16)***Figure It Out***N 2.1 [Multiplying Madness](https://nzmaths.co.nz/node/3063) (12)N 2.1  [The Pig Pen](https://nzmaths.co.nz/node/3065) (13)N 2.2 [To Market](https://nzmaths.co.nz/node/3091) (16-17)BF2-3 [An Apple A Day](https://nzmaths.co.nz/node/2862) (9)BF 2-3 [On Track](https://nzmaths.co.nz/node/2863) (10)BF 3 [Field of 100 Sheep](https://nzmaths.co.nz/node/2894) (16-17) |
| Solve five times tables by doubling and halving (and learn them) | ***Teaching Multiplication and Division (Book 6)***[Twos, Fives, And Tens](https://nzmaths.co.nz/node/926) (21-23)***Figure It Out***N2.2 [Double Trouble](https://nzmaths.co.nz/node/3092) (18)NS7/8.1 [Flying Feet](https://nzmaths.co.nz/node/4188) (9)   |
| Use the commutative property, e.g. 4 × 6 = 6 × 4 | ***Teaching Multiplication and Division (Book 6)******Introduction (11-12)***[***Animal Array***](https://nzmaths.co.nz/node/919)***s (15-16)***[***Turn Abouts***](https://nzmaths.co.nz/node/922) ***(34-36)******Figure It Out******BF 3*** [***Choco-blocks***](https://nzmaths.co.nz/node/2888) ***(10)*** |
| Dividing by sharing using addition to predict | ***Teaching Multiplication and Division (Book 6)******Introduction (11-12)***[***Pirate Crews***](https://nzmaths.co.nz/node/925) ***(17-18)******Figure It Out******N 2.2*** [***The Dinosaur Dig***](https://nzmaths.co.nz/node/3093) ***(19)*** |
| Dividing by making equal sets | ***Teaching Multiplication and Division (Book 6)***[***Biscuit Boxes***](https://nzmaths.co.nz/node/924) ***(19-20)******Figure It Out******N 2.2*** [***The Dinosaur Dig***](https://nzmaths.co.nz/node/3093) ***(19)*** |

***Transition: Advanced Counting to Early Additive Domain: Proportions and Ratios***

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| **Key Teaching Ideas** | **References**  |
| Find a unit fraction of a set using addition facts, particularly doubles,e.g. 1/4 of 16 is 4 using 1/2 of 16 is 8. | ***Teaching Fractions, Decimals and Percentages (Book 7)***Introduction (4-10,15)[Animals](https://nzmaths.co.nz/node/921) (18-20)[Hungry Birds](https://nzmaths.co.nz/node/920) (22-24)***Figure It Out***N 2.1 [Flipping Fractions](https://nzmaths.co.nz/node/3069) (17)N.2.1 [Dazzler Digs On](https://nzmaths.co.nz/node/3072) (19)N2.1 [Cooking Up a Storm](https://nzmaths.co.nz/node/3073) (20)N2.2 [Tummyache](https://nzmaths.co.nz/node/3094) (20)N2.2 [Finding Fractions](https://nzmaths.co.nz/node/3097) (24)N2-3 [Flitting with Fractions](https://nzmaths.co.nz/node/3134) (21) |
| Find unit fractions of a continuous region, like a length or area, using halving. | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Wafers***](https://nzmaths.co.nz/node/952) ***(16-18)******Figure It Out******N2.1 (21)******[Puzzling Shapes](https://nzmaths.co.nz/node/3074)******N2-3 (17)******[Circle Segment](https://nzmaths.co.nz/node/3126)******N2-3 (18)******[Fabulous Folding](https://nzmaths.co.nz/node/3127)******N2-3 (19)******[Getting in Shape](https://nzmaths.co.nz/node/3132)*** |
| Order unit fractions and fractions with the same denominator and explain why they are larger or smaller | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Fraction Circles***](https://nzmaths.co.nz/node/927) ***(20-22)*** |
| Order fractions visually using materials, including improper fractions like 5/3 and 7/4, and explain what the numerator and denominator mean. | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Fraction Circles***](https://nzmaths.co.nz/node/927) ***(20-22)*** |

***Transition: Early Additive to Advanced Additive Domain: Addition and Subtraction***

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| **Key Teaching Ideas** | **References**  |
| Introduction to using the number line to solve change unknown problems(Key Idea #1) | *Teaching Addition and Subtraction (Book 5)*[Jumping the Number Line](https://nzmaths.co.nz/node/932) (54)  |
| 10 tens make one hundred and 10 hundreds make one thousand(Key Idea #2) | *Teaching Addition and Subtraction (Book 5)*[*How many ten dollar notes?*](https://nzmaths.co.nz/node/917) *(55)*[*How many tens and hundreds?*](https://nzmaths.co.nz/node/928) *(56)**Figure It Out**N3.3* [*Banking Issues*](https://nzmaths.co.nz/node/3224) *(3)* |
| Solve addition and subtraction problems using place value(Key Idea #3) | *Teaching Addition and Subtraction (Book 5)*[*Addition and Subtraction on the Number Line*](https://nzmaths.co.nz/node/25707) *(56)*[*Problems Like o + 29 = 81*](https://nzmaths.co.nz/node/25706) *(57)**Figure It Out**N2.1* [*Hip Hup Hop*](https://nzmaths.co.nz/node/3058) *(8)**N2.1* [*Weka Wobble*](https://nzmaths.co.nz/node/3060) *(11)**N2.1* [*What’s My Number*](https://nzmaths.co.nz/node/3068) *(16)**N3.3* [*Slippery Slope*](https://nzmaths.co.nz/node/3227) *(8)**N3-4.1* [*Money Everywhere*](https://nzmaths.co.nz/node/3249) *(1)**NS&AT3.1* [*Megabytes of Memory*](https://nzmaths.co.nz/node/4066) *(4)**N7/8 L.1* [*Firewood Fever*](https://nzmaths.co.nz/node/3361) *(16)**N7/8 L.1* [*Space Zapper*](https://nzmaths.co.nz/node/3353) *(8)**N7/8 L.1* [*Fund-raising*](https://nzmaths.co.nz/node/3349) *(6)* |
| Solve addition and subtraction problems by using rounding and compensating(Key Idea # 4) | *Teaching Addition and Subtraction (Book 5)*[*When One Number is Near One Hundred*](https://nzmaths.co.nz/node/942) *(58)*[*Problems Like 73 – 19 = o*](https://nzmaths.co.nz/node/940) *(59)*[*Problems Like 23 + o = 71*](https://nzmaths.co.nz/node/931) *(60)*[*Problems Like o + 29 = 81*](https://nzmaths.co.nz/node/25706) *(60)* |
| Addition and subtraction are inversely related(Key Idea #5) | *Teaching Addition and Subtraction (Book 5)*[*Don’t Subtract – Add!*](https://nzmaths.co.nz/node/933) *(61)**Figure It Out**BF3* [*Array Puzzles*](https://nzmaths.co.nz/node/2886) *(8)* |
| Solve subtraction problems with the mental strategy of equal adjustments(Key Idea # 6) | *Teaching Addition and Subtraction (Book 5)*[*Equal Additions*](https://nzmaths.co.nz/node/934) *(62)**Figure It Out**N3.2* [*Tracking Toroa*](https://nzmaths.co.nz/node/3200) *(1)**NS&AT3.1* [*Tidying Up*](https://nzmaths.co.nz/node/4065) *(2)* |
| Choosing wisely(Key Idea #7) | *Teaching Addition and Subtraction (Book 5)*[*Mixing the Methods- Mental Exercises for the Day*](https://nzmaths.co.nz/node/943) *(63)*[*Mixing the methods – mental exercises for the day*](https://nzmaths.co.nz/node/943) *(63)* |
| Using the standard written form to solve addition and subtraction problems(Key Idea #8) | *Teaching Addition and Subtraction (Book 5)*[*A Standard Written Form for Addition*](https://nzmaths.co.nz/node/1032) *(64)*[*Decomposition – a Written Form for Subtraction*](https://nzmaths.co.nz/node/1033) *(65)*[*Large Numbers Roll Over*](https://nzmaths.co.nz/node/935) *(66)*[*Mental or Written?*](https://nzmaths.co.nz/node/936) *(66)* |

***Transition: Early Additive to Advanced Additive Domain: Multiplication and Division***

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| **Strategies being developed** | **References**  |
| Use times five facts to work out times six, seven, and four facts (using the distributive property) | *Teaching Multiplication and Division (Book 6)*Introduction (24-25)[Fun With Fives](https://nzmaths.co.nz/node/944) (28-30)[A Little Bit More/A Little Bit Less](https://nzmaths.co.nz/node/945) (32-34)*Figure It Out*N7/8.1  [Fives And Tens](https://nzmaths.co.nz/node/3331) (4-5) |
| Use times ten facts to work out times nine facts (using the distributive property) | *Teaching Multiplication and Division (Book 6)*[A Little Bit More/A Little Bit Less](https://nzmaths.co.nz/node/945) (32-34)*Figure It Out*N 7/8 Link 2 [Planting With The Whanau](https://nzmaths.co.nz/node/3374) (6)  |
| Change the order of the factors to make a multiplication problem easier, e.g. 26 x 3 = 3 x 26 | *Teaching Multiplication and Division (Book 6)*[Turn Abouts](https://nzmaths.co.nz/node/922) (34-36)*Figure It Out*N 2-3 [High Flyers](https://nzmaths.co.nz/node/3123) (14)BF 2-3 [Times Up](https://nzmaths.co.nz/node/2861) (8)NS&AT2-3.1 [Keeping Score](https://nzmaths.co.nz/node/4014) (6-7) |
| Find out how many ones, tens, hundreds and thousands are in all of a whole number, | *Teaching Multiplication and Division (Book 6)*[Changing Money](https://nzmaths.co.nz/node/1025) (25-28)  |
| Use two times facts to work out three, four, six, and eight times facts (using doubling and the distributive property) | *Figure It Out*BF 3 [Factor Puzzles](https://nzmaths.co.nz/node/2889) (11)BF 3 [Stars And Students](https://nzmaths.co.nz/node/2890) (12)BF 3 [Digital Delights](https://nzmaths.co.nz/node/2891) (13)BF 3 [Multiple Mirrors](https://nzmaths.co.nz/node/2897) (21)N 7/8 Link [Table Tricks](https://nzmaths.co.nz/node/3371) (2)N 7/8 Link [Fun Factor](https://nzmaths.co.nz/node/3373) (5) |
| Multiply by tens, hundreds, thousands, and other multiples of ten | *Teaching Multiplication and Division (Book 6)*[Multiplying Tens](https://nzmaths.co.nz/node/949) (30-32)*Figure It Out*N 3.1 [Standing Room Only](https://nzmaths.co.nz/node/3148) (4)N 3.1 [Tens Time](https://nzmaths.co.nz/node/3155) (8)NS 7/8 Link [It Pays to Win!](https://nzmaths.co.nz/node/4198) (18) |
| Solve sharing problems by reversing multiplication facts | *Teaching Multiplication and Division (Book6)*[*Goesintas*](https://nzmaths.co.nz/node/951) *(38-40)**Figure It Out**N 2-3* [*Wheel and Deal*](https://nzmaths.co.nz/node/3124) *(15)**N 2-3* [*Stepping Out*](https://nzmaths.co.nz/node/3125) *(16)* |
| Solve “How many equal sets of ?” problems by reversing multiplication facts | *Teaching Multiplication and Division (Book6)*[*Long jumps*](https://nzmaths.co.nz/node/950) *(36-38)**Figure It Out**BF 2-3* [*Heading for Home*](https://nzmaths.co.nz/node/2864) *(11)**N 7/8 Link* [*Container Contents*](https://nzmaths.co.nz/node/3358) *(13)* |
| Solve problems using a combination of addition, subtraction, multiplication and division mental strategies | *Figure It Out**BF 2.1* [*Dazzler Digs On*](https://nzmaths.co.nz/node/3072) *(19)**BF 2.1* [*Pocket Money*](https://nzmaths.co.nz/node/3067) *(15)**BF 2-3* [*Thirty One or None*](https://nzmaths.co.nz/node/2857) *(4)**NS&AT 7/8.1**[Choice Calculations](https://nzmaths.co.nz/node/4183)**NS&AT 7/8.1* [*Splitting Numbers*](https://nzmaths.co.nz/node/4184) *(2)**NS&AT 7/8.1* [*Hit the Target*](https://nzmaths.co.nz/node/4186) *(7)**NS&AT 7/8.1* [*Pathways*](https://nzmaths.co.nz/node/4187) *(8)* |

***Transition: Early Additive to Advanced Additive Domain: Ratios and Proportions***

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| **Strategies being developed** | **References**  |
| Find fractions of a set using multiplication and division, e.g. of 21 is 7 ( × 21 = 7) | *Teaching Fractions, Decimals and Percentages (Book 7)*Introduction (25-26)[Birthday Cakes](https://nzmaths.co.nz/node/948) (26-28)*Figure It Out*N2.1 [Cooking Up a Storm](https://nzmaths.co.nz/node/3073) (20)N3.1 [Sweet As](https://nzmaths.co.nz/node/3159) (12)N3.2 [Saving Up](https://nzmaths.co.nz/node/3204) (5)N3.2 [On the Trail](https://nzmaths.co.nz/node/3219) (23)N7/8 L1 [Piece of Cake](https://nzmaths.co.nz/node/3364) (20)N7/8 L1 [Bits and Pieces](https://nzmaths.co.nz/node/3369) (24)NS7/8 L2 (21) [Helping the Hāngi](https://nzmaths.co.nz/node/3365)N7/8 4.2 (21) [Mystery Fractions](https://nzmaths.co.nz/node/3415) |
| Use symmetry to find fractions of continuous shapes like lengths, circles, and rectangles. | *Teaching Fractions, Decimals and Percentages (Book 7)*[*Fractional Blocks*](https://nzmaths.co.nz/node/947) *(28-30)**Figure It Out**N2.1* [*Fun Folding*](https://nzmaths.co.nz/node/3096) *(22)**N 2-3* [*Don’t Ditch the Boat*](https://nzmaths.co.nz/node/3136) *(23)**N 2-3* [*Dividing Dough*](https://nzmaths.co.nz/node/3135) *(22)**N7/8 L1* [*All Bottled Up*](https://nzmaths.co.nz/node/3367) *(23)* |
| Solve division problems that have fraction answers using halving. | *Figure It Out**N2-3* [*Job Sharing*](https://nzmaths.co.nz/node/3137) *(24)* |
| Create equivalent ratios by repeated copying. | *Teaching Fractions, Decimals and Percentages (Book 7)*[*Seed Packets*](https://nzmaths.co.nz/node/1020) *(30-32)* |
| Measure how many times a unit fraction goes into a whole number,e.g. How many quarters are in five? (5 ÷ = 20)  |  |
| Rename improper fractions as mixed numbers using materials with multiplication, and position improper fractions on a number line. | *Teaching Fractions, Decimals and Percentages (Book 7)*[*Trains*](https://nzmaths.co.nz/node/953) *(32-34)**Figure It Out**N2.2* [*Hot Stuff!*](https://nzmaths.co.nz/node/3095) *(21)* |

***Transition: Early Additive to Advanced Additive Domain: Algebraic Thinking***

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| **Strategies being developed** | **References**  |
| Find relationships in repeating and sequential patterns and represent the relationships using additive and simple multiplicative rules,e.g. In the sequence 3, 7, 11, 15, …, the tenth number can be found by3 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 = 39  | T*eaching Number through Measurement, Geometry, Algebra, and Statistics (Book 9)*[Sticky Moments](https://nzmaths.co.nz/node/2520) (34-38)*Figure It Out*Alg 2-3 [Pick the Pattern](https://nzmaths.co.nz/node/2515) (1)Alg 2-3 [The Mystery of the Vanishing Pattern](https://nzmaths.co.nz/node/2516) (2)Alg 2-3 [Sticky Moments](https://nzmaths.co.nz/node/2520) (5)Alg 3 [Terrific Tiles](https://nzmaths.co.nz/node/2551) (1)Alg 3 [Sticking Around](https://nzmaths.co.nz/node/2552) (2)Alg 3 [Tukutuku Patterns](https://nzmaths.co.nz/node/2554) (3)Alg 3 [Pegging Problems](https://nzmaths.co.nz/node/2556) (4)Alg 3 [Pattern Parade](https://nzmaths.co.nz/node/2560) (5)*nzmaths website*[Matchstick Patterns](https://nzmaths.co.nz/node/369)[Hundreds of Patterns](https://nzmaths.co.nz/node/373) |
| Find relationships in patterns and ordered pairs, and describe the relationships using word rules, tables, and graphs.  | T*eaching Number through Measurement, Geometry, Algebra, and Statistics (Book 9)*[Sticky Moments](https://nzmaths.co.nz/node/2520) (34-38)*Figure It Out*Alg 2-3 [Punching Numbers](https://nzmaths.co.nz/node/2518) (3)Alg 2-3 [Follow that Arrow](https://nzmaths.co.nz/node/2519) (4)Alg 3 [Biscuit Binge](https://nzmaths.co.nz/node/2576) (14)Alg 3 [Kai Moana](https://nzmaths.co.nz/node/2577) (16)Alg 7/8 4.3 [Letter Design](https://nzmaths.co.nz/node/2721) (10)Alg 7/8 4.3 [Building Patterns Constantly](https://nzmaths.co.nz/node/381)  |
| Use a rule to create a pattern. | *Figure It Out*Alg 2-3 [Number Nibbles](https://nzmaths.co.nz/node/2530) (16)Alg 3 [Operation Time](https://nzmaths.co.nz/node/2569) (10) |
| Interpret relationships shown in equations using the properties of operations and understanding of the equals sign. | *Figure It Out*Alg 2-3 [Crunch Machine](https://nzmaths.co.nz/node/2532) (17)Alg 2-3 [Perfect Patterns](https://nzmaths.co.nz/node/2533) (18)Alg 2-3 [What Goes Where?](https://nzmaths.co.nz/node/2535) (20)Alg 2-3 [Something Fishy](https://nzmaths.co.nz/node/2538) (22)Alg 2-3 [The Potluck Paint Company](https://nzmaths.co.nz/node/2586) (24)Alg 3 [Seesaw Numbers](https://nzmaths.co.nz/node/2581) (19)Alg 3-4 [Robot Rescue](https://nzmaths.co.nz/node/2616) (23) *nzmaths website*[Properties of Operations](https://nzmaths.co.nz/node/380) [Cups and Cubes](https://nzmaths.co.nz/node/386) |

***Transition: Advanced Additive to Advanced Multiplicative Domain: Addition and Subtraction***

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| **Strategies being developed** | **References**  |
| To add or subtract fractions, they must be renamed to have a common denominator(Key Idea #1) | *Teaching Fractions Decimals and Percentages (Book 7)*[Comparing Apples With Apples](https://nzmaths.co.nz/node/967) (65) |
| Decimal fractions arise out of division(Key Idea #2) | *Teaching Addition and Subtraction (Book 5)*[Introducing Decimal Fraction Place Value](https://nzmaths.co.nz/node/1105) (69) |
| The “ten for one” and “one for ten” canons apply when adding and subtracting with decimal fractions (one-decimal-place-fractions)(Key Idea #3) | *Teaching Addition and Subtraction (Book 5)*[*Adding With Decimal Fractions*](https://nzmaths.co.nz/node/1107) *(71)*[*Subtraction with tenths*](https://nzmaths.co.nz/node/1108) *(71)**Teaching Addition and Subtraction (Book 7)*[*How Can Two Decimals So Ugly Make One So Beautiful?*](https://nzmaths.co.nz/node/1113) *(45)* |
| Subtraction can produce negative numbers.(Key Idea #4) | *Teaching Addition and Subtraction (Book 5)*[*Dollars and Bills*](https://nzmaths.co.nz/node/1028) *(73)*[*Dropping and Rising Temperatures*](https://nzmaths.co.nz/node/25704) *(73)*[*Bucket Balance*](https://nzmaths.co.nz/node/25705) *(74)**Teaching Algebraic Thinking and Number Sense (Book 8)*[*6 Minus 8 Does Work!*](https://nzmaths.co.nz/node/999) *(31)**Figure It Out**N3-4.1* [*Walking the Plank*](https://nzmaths.co.nz/node/3270) *(23)**N3-4.3* [*The Volcanoes Erupt*](https://nzmaths.co.nz/node/3326) *(20)**N3-4.3* [*Chilly Heights*](https://nzmaths.co.nz/node/3327) *(22)**N7/8 4.4* [*It’s a Try*](https://nzmaths.co.nz/node/3472) *(8)**N7/8 4.4* [*Lifting Weights*](https://nzmaths.co.nz/node/3473) *(9)**N7/8 4.4* [*Integer Zap*](https://nzmaths.co.nz/node/3475) *(10)**N7/8 4.4* [*Shifty Subtraction*](https://nzmaths.co.nz/node/3480) *(15)**N7/8 4.6* [*Judo Competition*](https://nzmaths.co.nz/node/3570) *(14)* |
| Round whole numbers and decimals, with up to two places, to the nearest whole number, or tenth. | *Teaching Number Knowledge (Book 4)*[*Swedish Rounding*](https://nzmaths.co.nz/node/1083) *(28)*[*Sensible Rounding*](https://nzmaths.co.nz/node/1084) *(28)**Figure It Out**NS 7/8* [*Number Scavenge*](https://nzmaths.co.nz/node/10793) *(6)**NS 7/8 2* [*Time Versus Money*](https://nzmaths.co.nz/node/4216) *(7)* |
| Carry out column addition and subtraction for whole numbers and decimals. | *Figure It Out**Ns 7/8 2* [*Same Answer Every Time!*](https://nzmaths.co.nz/node/4220) *(11)* |

***Transition: Advanced Additive to Advanced Multiplicative Domain: Multiplication and Division***

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| **Strategies being developed** | **References**  |
| Use standard place value to solve multiplication problems (distributive property) | *Teaching Multiplication and Division (Book 6)*Introduction (41-43)[Multiplication Smorgasbord](https://nzmaths.co.nz/node/946)(52-54)*Figure It Out*N3 [High Powered Thinking](https://nzmaths.co.nz/node/3195) (29)N3.2 [Singing up a Storm](https://nzmaths.co.nz/node/3206) (7)N3.2 [Booked!](https://nzmaths.co.nz/node/3207) (8-9)N 3.2 [That Old?](https://nzmaths.co.nz/node/3209) (12-13)N 3.2 [Sweet Thoughts](https://nzmaths.co.nz/node/3212) (15)N 3.3 [What a View!](https://nzmaths.co.nz/node/3231) (12)N 3-4.1 [Lookalike](https://nzmaths.co.nz/node/3264) (17)N 3-4.3 [Dog’s Dinner](https://nzmaths.co.nz/node/3318) (14)BF3-4 [Trying Times](https://nzmaths.co.nz/node/2904) (2)BF3-4 [Eleventh Heaven](https://nzmaths.co.nz/node/2905) (3)NS&AT 4.1 [The Greenhouse Effect](https://nzmaths.co.nz/node/4218) (9) |
| Use tidy numbers to solve multiplication problems (distributive property) | *Teaching Multiplication and Division (Book 6)*[*Multiplication Smorgasbord*](https://nzmaths.co.nz/node/946) *(52-54)**Figure It Out**N3.2*  [*Multiple Methods*](https://nzmaths.co.nz/node/3208)*(10/11)**N 3-4.1* [*Hard Times*](https://nzmaths.co.nz/node/3262) *(15)**N 3-4.1* [*Multiplication Roundabouts*](https://nzmaths.co.nz/node/3263) *(16)**NS&AT 3.1 (6-7)**[What’s Best?](https://nzmaths.co.nz/node/4067)* |
| Use proportional adjustment like doubling and halving, thirding and trebling, to solve multiplication problems | *Teaching Multiplication and Division (Book 6)*[*Cut and Paste*](https://nzmaths.co.nz/node/956) *(49-51))**Teaching Number Sense and Algebraic Thinking (Book 8)*[*Doubling and Halving*](https://nzmaths.co.nz/node/957) *(14)*[*Multiplying by 25*](https://nzmaths.co.nz/node/962) *(14)**Figure It Out**NS 7/8.1* [*Double and Halve*](https://nzmaths.co.nz/node/4190) *(11)**NS&AT2-3.1* [*Clean Cars*](https://nzmaths.co.nz/node/4023) *(18-19)**NS&AT2-3.2* [*Fair Mix*](https://nzmaths.co.nz/node/4055) *(11)* |
| Use standard place value to solve division problems, including written forms, e.g. 8 | *Teaching Multiplication and Division (Book 6)*[*Paper Power*](https://nzmaths.co.nz/node/963) *(63-67)**Figure It Out**N 3.3* [*Busking Blues*](https://nzmaths.co.nz/node/3230) *(11)**N 3.3* [*Arcade Adventure*](https://nzmaths.co.nz/node/3241) *(18)* |
| Use standard place value with tidy numbers to solve division problems | *Teaching Multiplication and Division (Book6)*[*Paper Power*](https://nzmaths.co.nz/node/963/) *(63-67)**Figure It Out**N 3-4.1* [*Division Delights*](https://nzmaths.co.nz/node/3265) *(18)* |
| Use splitting by factors to solve multiplication and division problems | *Teaching Multiplication and Division (Book 6)*[*Little Bites at Big Multiplications and Divisions*](https://nzmaths.co.nz/node/1062) *(76-79)**Figure It Out**NS&AT 3-4.1* [*The Factoring Factory*](https://nzmaths.co.nz/node/4153) *(4)* |
| Simplify division problems by changing both numbers (halving, thirding etc.) | *Teaching Multiplication and Division (Book 6)*[*The Royal Cooking Lessons*](https://nzmaths.co.nz/node/960) *(57-60)**Teaching Number Sense and Algebraic Thinking (Book 8)*[*Equals Sign Again*](https://nzmaths.co.nz/node/1016) *(12)**Figure It Out**NS&AT3.2* [*Horsing Around*](https://nzmaths.co.nz/node/4124) *(11)* |
| Use proportional adjustment to solve division problems | *Teaching Multiplication and Division (Book 6)*[*Proportional Packets*](https://nzmaths.co.nz/node/959) *(54-57)**Figure It Out**NS 7/8 Link* [*Division Dilemmas*](https://nzmaths.co.nz/node/4206) *(24)* |
| Use place value units to solve multiplication and division problems, including written multiplication algorithms,e.g. 34 × 26  | *Teaching Multiplication and Division (Book 6)*[*Cross Products*](https://nzmaths.co.nz/node/1026) *(67-69)**Figure It Out**N3-4.3 (8-9)**[Number Patterns](https://nzmaths.co.nz/node/3315)**N3-4.3 (12-13)**[How Many?](https://nzmaths.co.nz/node/3317)**N 7/8.3* [*Orchard Antics*](https://nzmaths.co.nz/node/3439) *(23)**N 7/8.5* [*Plastic Fantastic*](https://nzmaths.co.nz/node/3545) *(17)**NS7/8 Link* [*Keep Your Shirt On*](https://nzmaths.co.nz/node/4204) *(23)**NS7/8.2* [*No Space to Spare*](https://nzmaths.co.nz/node/4225) *(18)**NS&AT 3-4.1* [*Tile the Town – Tiny!*](https://nzmaths.co.nz/node/4162) *(20-21)* |
| Solve division problems that involve remainders expressing the remainders as whole numbers, fractions or decimals depending on the context,e.g. 38 ÷ 4 = 9 r2 or 9.5 or 9½ | *Teaching Multiplication and Division (Book 6)*[*Remainders*](https://nzmaths.co.nz/node/961) *(60-62)**Figure It Out**BF3* [*It Remains to be Seen*](https://nzmaths.co.nz/node/2898) *(22)**N 7/8 4.3* [*Digit Challenge*](https://nzmaths.co.nz/node/3435) *(18)**N7/8 4.5* [*Revisiting Remainders*](https://nzmaths.co.nz/node/3529) *(1)**N7/8 4.5* [*Remainder Bingo*](https://nzmaths.co.nz/node/3530) *(2)**NS&AT3.1* [*Just Right!*](https://nzmaths.co.nz/node/4068) *(8-9)**NS&AT3.2* [*Triple Trouble*](https://nzmaths.co.nz/node/4118) *(1)**N7/8.3* [*Team Leaders*](https://nzmaths.co.nz/node/3427) *(10)* |
| Use divisibility rules for 2, 3, 4, 5, 6, 8, 9 | *Teaching Multiplication and Division (Book 6)*[*Nines and Threes*](https://nzmaths.co.nz/node/1063) *(70-72)**Teaching Number Sense and Algebraic Thinking (Book 8)*[*Divisibility Tests*](https://nzmaths.co.nz/node/1007) *(33)**Figure It Out**N3.3 (14-15)**[Easy Nines](https://nzmaths.co.nz/node/3238)**BF 3* [*Dicey Dabble*](https://nzmaths.co.nz/node/2896) *(20)**NS&AT3-4.1* [*Digital Dilemmas*](https://nzmaths.co.nz/node/4127) *(19)**NS&AT3-4.1* [*Wheeling And Dealing*](https://nzmaths.co.nz/node/4163) *(22-24)**NS 7/8 4.2* [*Divide and Conquer*](https://nzmaths.co.nz/node/4211) *(2)* |
| Anticipate what happens to a number when it is multiplied or divided by ten, one hundred, one thousand, and so on. |  |
| Solve problems using a combination of the four operations, including using the order of operations | *Figure It Out**BF 3* [*Making Numbers*](https://nzmaths.co.nz/node/2900) *(24)**N 3.1* [*Dead Calculators*](https://nzmaths.co.nz/node/3192) *(19)**N 3.1* [*Speedy Types*](https://nzmaths.co.nz/node/3194) *(21)**N 3.1* [*Human Pyramids*](https://nzmaths.co.nz/node/3196) *(23)**N 3.3* [*Wheels Galore*](https://nzmaths.co.nz/node/3242) *(19)**N 3-4.1* [*Think Tank*](https://nzmaths.co.nz/node/3267) *(20)**N 3-4.2* [*Oceans Apart*](https://nzmaths.co.nz/node/3286) *(4)**N 3-4.2* [*Food for All*](https://nzmaths.co.nz/node/3287) *(5)**N 3-4.3* [*Number Patterns*](https://nzmaths.co.nz/node/3315) *(8)**N3.3* [*Easy Nines*](https://nzmaths.co.nz/node/3238) *(14-15)**N7/8.5* [*Order of Operations*](https://nzmaths.co.nz/node/3535) *(6)**N7/8.5* [*Operations Checker*](https://nzmaths.co.nz/node/3536) *(7)* |

***Transition: Advanced Additive to Advanced Multiplicative Domain: Ratios & Proportions***

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| **Strategies being developed** | **References**  |
| Find equivalent fractions by splitting, e.g. = , by splitting each quarter into fifths. | ***Teaching Fractions, Decimals and Percentages (Book 7)***Introduction (35-37)***Teaching Number Sense and Algebraic Thinking (Book 8)***[Equivalent Fractions](https://nzmaths.co.nz/node/841) (16)***Figure It Out***N3.1 [Fun with Fractions](https://nzmaths.co.nz/node/3156) (9)N3.1 [More Fractions](https://nzmaths.co.nz/node/3157) (10)N3.1 [Racing to New Heights](https://nzmaths.co.nz/node/3161) (14)N3.3 [Fraction Frenzy](https://nzmaths.co.nz/node/3245) (22)N3-4.1 [A Watery Mission](https://nzmaths.co.nz/node/3251) (3)N3-4.2 (11) [Sandwich Survey](https://nzmaths.co.nz/node/3292)NS&AT 3.1 [Fraction Tagging](https://nzmaths.co.nz/node/4113) (18)N7/8 L2 [Boxed Biscuits](https://nzmaths.co.nz/node/3417) (24)PR 3-4.1 [Paper Partitions](https://nzmaths.co.nz/node/4733) (6) |
| Order fractions using equivalence and benchmarks, e.g. < because is less than and is less. | ***Teaching Number Sense and Algebraic Thinking (Book 8)***[***Estimating with Fractions***](https://nzmaths.co.nz/node/1014) ***[(15)](https://nzmaths.co.nz/node/1014)***[***Fractions***](https://nzmaths.co.nz/node/1014) ***(16)******Figure It Out******NS&AT 3-4.1*** [***Close Ties***](https://nzmaths.co.nz/node/4159) ***(14)*** |
| Find fractions of lengths, areas, volumes and other continuous quantities using reunitising,e.g. three quarters of one half is three eighths | ***Figure It Out******PR 3+*** [***Puzzling Patterns***](https://nzmaths.co.nz/node/4683) ***(1)******PR 3+*** [***Shaping Up***](https://nzmaths.co.nz/node/4440) ***(2)******PR 3+*** [***What Do You See?***](https://nzmaths.co.nz/node/4687) ***(6)******PR 3-4.1*** [***Tri Fractions***](https://nzmaths.co.nz/node/4731) ***(4)*** |
| Find fractions of whole number amounts using multiplication and division,e.g. of 36 = o( 36). | ***Teaching Number Sense and Algebraic Thinking (Book 8)***[***Whole Numbers Times Fractions***](https://nzmaths.co.nz/node/971) ***(22)***[***Fractions Times Whole Numbers***](https://nzmaths.co.nz/node/970) ***(23)******Figure It Out******N3.2*** [***Heading for Home***](https://nzmaths.co.nz/node/2864) ***(24)******N3.3*** [***Marble Marvels***](https://nzmaths.co.nz/node/3244) ***(21)******N3-4.2*** [***Funky Fractions***](https://nzmaths.co.nz/node/3293) ***(12)******N3-4.2*** [***Measuring Up***](https://nzmaths.co.nz/node/3294) ***(13)******N3-4.3*** [***Sporting Fractions***](https://nzmaths.co.nz/node/3324) ***(16)******NS & AT 3.2*** [***On Top of the World***](https://nzmaths.co.nz/node/4132) ***(22)******NS7/8 4.2*** [***Mystery Fractions***](https://nzmaths.co.nz/node/3415) ***(21)******N7/8 L2*** [***Placing Points***](https://nzmaths.co.nz/node/3413) ***(18)******N7/8 4.3*** [***Linking Lollies***](https://nzmaths.co.nz/node/3418) ***(1)******N7/8 4.3*** [***Football Fractions***](https://nzmaths.co.nz/node/3421) ***(4)******PR 3+*** [***Star Clusters***](https://nzmaths.co.nz/node/4686) ***(5)******PR 3-4.1*** [***Fraction Extraction***](https://nzmaths.co.nz/node/4735) ***(8)*** |
| Multiply fractions by other fractions,e.g. x = = | ***Teaching Number Sense and Algebraic Thinking (Book 8)***[***A Fraction Times a Fraction***](https://nzmaths.co.nz/node/991) ***(24)***[***When Big Gets Smaller***](https://nzmaths.co.nz/node/989) ***(24)*** |
| Rename improper fractions as mixed numbers using division, and position improper fractions on a number line. | ***Teaching Number Sense and Algebraic Thinking (Book 8)***[***Fractions Greater Than 1***](https://nzmaths.co.nz/node/966) ***(17)******Figure It Out******PR 3-4.1*** [***Fraction Line-up***](https://nzmaths.co.nz/node/4730) ***(2)*** |
| Solve division problems that have fraction answers, e.g. 8 3 = 2, and connect division with the numerator and denominator of the answer, e.g. 4 5 = . | ***Figure It Out******N3.1*** [***Friendly Fractions***](https://nzmaths.co.nz/node/3160) ***(13)******N 7/8 4.5*** [***Revisiting Remainders***](https://nzmaths.co.nz/node/3529) ***(1)*** |
| Convert fractions to decimals, and percentages and vice versa. | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Deci-mats***](https://nzmaths.co.nz/node/964) ***(41-44)******Figure It Out******BF 3-4*** [***Mystery Decimals***](https://nzmaths.co.nz/node/2928) ***(21)******BF 3-4*** [***Decimal Spotting***](https://nzmaths.co.nz/node/2931) ***(24)******N 3-4.1*** [***Waves Win***](https://nzmaths.co.nz/node/3255) ***(8)******N 3-4.1*** [***Bottle Up***](https://nzmaths.co.nz/node/3257) ***(10)******N 3-4.1*** [***A Long Look at Decimals***](https://nzmaths.co.nz/node/3258) ***(11)******NS 7/8 4.2*** [***Pizza Pieces***](https://nzmaths.co.nz/node/4226) ***(19)******N 7/8 L2*** [***Seeing Double***](https://nzmaths.co.nz/node/3376) ***(9)******N 7/8 L2*** [***Getting the Point***](https://nzmaths.co.nz/node/3414) ***(20)******N 7/8 4.3*** [***Conversion Cousins***](https://nzmaths.co.nz/node/3419) ***(2)******PR 3+*** [***Discount Deals***](https://nzmaths.co.nz/node/4689) ***(8)*** |
| Estimate and find percentages of whole number amounts using benchmark percentages,e.g. 65% of $80 as 50% is $40, 10% is $8, 5% is $4, so $40 + $8 + $4 = $52 | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Hot Shots***](https://nzmaths.co.nz/node/1131) ***(47-49)******Figure It Out******NS & AT 3-4.1*** [***Pondering Percentages***](https://nzmaths.co.nz/node/4156) ***(12)******N3.2*** [***Better Buy Bargains***](https://nzmaths.co.nz/node/3216) ***(18)******N 3.3*** [***Surf’s Up***](https://nzmaths.co.nz/node/3246) ***(24)******N 3-4.1*** [***Hot Shots***](https://nzmaths.co.nz/node/3259) ***(12)******N 3-4.2*** [***Making Money***](https://nzmaths.co.nz/node/3298) ***(16)******NS&AT 3-4.1*** [***Pondering Percentages***](https://nzmaths.co.nz/node/4156) ***(12)******NS 7/8.L1*** [***Playzone Discount***](https://nzmaths.co.nz/node/4196) ***(16)******NS 7/8 4.2*** [***People Power***](https://nzmaths.co.nz/node/4223) ***(15)******N 7/8 4.3*** [***Involving Interest***](https://nzmaths.co.nz/node/3423) ***(6)******N 7/8 4.3*** [***New Car Capers***](https://nzmaths.co.nz/node/3431) ***(14)******N 7/8 4.5*** [***Bargain Bonanza***](https://nzmaths.co.nz/node/3542) ***(14)******N 7/8 4.6*** [***Spending on Sport***](https://nzmaths.co.nz/node/3564) ***(10)******PR 3+*** [***Getting Tough***](https://nzmaths.co.nz/node/4695) ***(14)*** |
| Add and subtract fractions with related denominators, e.g. + = = 1. | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Comparing Apples with Apples***](https://nzmaths.co.nz/node/967) ***(38)******Teaching Number Sense and Algebraic Thinking (Book 8)***[***Estimating with Fractions***](https://nzmaths.co.nz/node/1014) ***(15)******Figure It Out******N 3.3*** [***Stacking Up***](https://nzmaths.co.nz/node/2717) ***(20)******N 7/8 4.5*** [***Egyptian Fractions***](https://nzmaths.co.nz/node/3552) ***(23)******PR 3-4.1*** [***Galloping Greyhounds***](https://nzmaths.co.nz/node/4727) ***(1)*** |
| Add and subtract decimals. | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Pipe Music with Decimals***](https://nzmaths.co.nz/node/968) ***(38-41)***[***How Can Two Decimals so Ugly..?***](https://nzmaths.co.nz/node/1113) ***(45-46)******Figure It Out******N 3.2*** [***Target Time***](https://nzmaths.co.nz/node/3213) ***(16)******N 3.2*** [***Dallying with Decimals***](https://nzmaths.co.nz/node/3215) ***(17)******N 3-4.3*** [***Riding the Waves***](https://nzmaths.co.nz/node/3307) ***(2)******N 7/8 4.3*** [***Going for Gold!***](https://nzmaths.co.nz/node/3429) ***(12)******Pr 3+*** [***Make 1.5***](https://nzmaths.co.nz/node/10795) ***(18)*** |
| Solve measurement problems with related fractions, by recognising equivalent fractions, e.g. How many sixths are in one and one half?(1 = = 9) | ***Teaching Number sense and Algebraic Thinking (Book 8)***[***Dividing Fractions***](https://nzmaths.co.nz/node/5981) ***(21)*** |
| Show the order of decimal numbers by developing a number line scale | ***Teaching Number sense and Algebraic Thinking (Book 8)***[***Scales on Number Lines***](https://nzmaths.co.nz/node/1000) ***(19)***[***Whole Number Rounding***](https://nzmaths.co.nz/node/972) ***(19)***[***Confusing Fractions and Decimals***](https://nzmaths.co.nz/node/1018) ***(20)*** |
| Solve simple rate problems using multiplication, e.g. Picking 7 boxes of apples in hour is equivalent to 21 boxes in 1 hours. | ***Figure it Out******N 3.3*** [***Numbers on the Line***](https://nzmaths.co.nz/node/3223) ***(2)******N 3-4.1*** [***More Thinking***](https://nzmaths.co.nz/node/3268) ***(21)******N 3-4.2*** [***Paddling Down the Waikato***](https://nzmaths.co.nz/node/3301) ***(19)******N 3-4.3*** [***Challenge Time***](https://nzmaths.co.nz/node/3309) ***(4)******N 3-4.3*** [***Paddle On***](https://nzmaths.co.nz/node/3313) ***(6)******N 3-4.3*** [***Feel the Beat***](https://nzmaths.co.nz/node/3316) ***(11)******NS 7/8.1*** [***Grocery Grapplers***](https://nzmaths.co.nz/node/4200) ***(20)******NS 7/8.1*** [***Shopping Around***](https://nzmaths.co.nz/node/4203) ***(22)******N 7/8 4.3*** [***Kapa Haka Hāngi***](https://nzmaths.co.nz/node/3434) ***(17)******PR 3+*** [***Speed Read***](https://nzmaths.co.nz/node/4691) ***(10)******PR 3+*** [***Demolition Dollars***](https://nzmaths.co.nz/node/4696) ***(16)******PR 3+*** [***Painting by Numbers***](https://nzmaths.co.nz/node/4697) ***(17)******PR 3+*** [***Tiring Teamwork***](https://nzmaths.co.nz/node/4699) ***(21)*** |
| Find equivalent ratios using multiplication and division and express them as equivalent fractions,e.g. 16:8 as 8:4 as 4:2 as 2:1 and = = =  | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Mixing Colours***](https://nzmaths.co.nz/node/983) ***(50-52)******Figure it Out******N 3-4.1*** [***Stretch and Grow***](https://nzmaths.co.nz/node/3253) ***(4)******N 3-4.1*** [***Bean Brains***](https://nzmaths.co.nz/node/3256) ***(9)******NS&AT 3.1*** [***Run Like the Wind***](https://nzmaths.co.nz/node/4072) ***(12)******NS&AT 3-4.2*** [***Lunchtime Mardi Gras***](https://nzmaths.co.nz/node/4178) ***(18-20)******NS 7/8 4.2*** [***Balancing Act***](https://nzmaths.co.nz/node/4230) ***(22)******N 7/8 4.5*** [***Bargain Packs***](https://nzmaths.co.nz/node/3543) ***(15)******N 7/8 4.6*** [***Hypertufa Tiles***](https://nzmaths.co.nz/node/3572) ***(17)******PR 3+*** [***Chocolate Choices***](https://nzmaths.co.nz/node/4685) ***(4)******PR 3+*** [***Pop Star Pics***](https://nzmaths.co.nz/node/4698) ***(20)******PR 3-4.1*** [***Smart Sizes***](https://nzmaths.co.nz/node/4743) ***(21)******PR 3-4.1*** [***The Right Gear***](https://nzmaths.co.nz/node/4773) ***(20)*** |

***Transition: Advanced Additive to Advanced Multiplicative Domain: Algebraic Thinking***

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| **Strategies being developed** | **References**  |
| Find relationships in repeating and sequential patterns and represent the relationships using additive and multiplicative rules,e.g. In the sequence 3, 7, 11, 15, …, the tenth number is 10 4 – 1 = 39.  | **T*eaching Number through Measurement, Geometry, Algebra, and Statistics (Book 9)***Sticky Moments (34-38)***Figure It Out***Alg 3 [Pattern Predictions](https://nzmaths.co.nz/node/2590) (1)Alg 3 [Duncan’s Day](https://nzmaths.co.nz/node/2578) (17)Alg 3 [Puzzling Patterns](https://nzmaths.co.nz/node/4683) (16)Alg 3-4 [All Square](https://nzmaths.co.nz/node/2591) (2)Alg 3-4 [Where to Sit](https://nzmaths.co.nz/node/2594) (4)Alg 3-4 [Waka Widths](https://nzmaths.co.nz/node/2597) (6)Alg 3-4 [Patterns and Rules](https://nzmaths.co.nz/node/2606) (16)Alg 7/8 L1 [Building Borders](https://nzmaths.co.nz/node/2790) (12)Alg 7/8 L1 [Tiling Teasers](https://nzmaths.co.nz/node/2795) (18)Alg 7/8 4.2 [Which DJ?](https://nzmaths.co.nz/node/2675) (1)Alg 7/8 4.2 [Straw Chains](https://nzmaths.co.nz/node/2676) (2)Alg 7/8 4.2 [Bailey Bridges](https://nzmaths.co.nz/node/2678) (6)Alg 7/8 4.2 [Stapled](https://nzmaths.co.nz/node/2682) (10)Alg 7/8 4.3 [Table Mats](https://nzmaths.co.nz/node/2715) (2)Alg 7/8 4.3 [Stacking Up](https://nzmaths.co.nz/node/2717) (4)Alg 7/8 4.3 [Stick Houses](https://nzmaths.co.nz/node/2717) (16) ***nzmaths website***[You can Count on Squares](https://nzmaths.co.nz/node/388)[Tukutuku Panels](https://nzmaths.co.nz/node/394) |
| Interpret and identify relationships in tables and graphs.  | **T*eaching Number Through Measurement, Geometry, Algebra, And Statistics (Book 9)***[**Sticky Moments**](https://nzmaths.co.nz/node/2520) **(34-38)*****Figure It Out*****Alg 3** [**Spreadsheet Challenge**](https://nzmaths.co.nz/node/2570) **(2)****Alg 3** [**Possum Poles**](https://nzmaths.co.nz/node/2561) **(6)****Alg 3** [**Ups and Downs**](https://nzmaths.co.nz/node/2567) **(9)****Alg 3-4** [**Tongan Travel**](https://nzmaths.co.nz/node/2605) **(14)****Alg 3-4** [**Graphic Details**](https://nzmaths.co.nz/node/2610) **(20)****Alg 7/8 L1** [**Cube Signs**](https://nzmaths.co.nz/node/2784) **(4)****Alg 7/8** [**Fencing**](https://nzmaths.co.nz/node/2785) **(6)****Alg 7/8** [**Patterns and Spreadsheets**](https://nzmaths.co.nz/node/2791) **(14)****Alg 7/8** [**Whānau Photo**](https://nzmaths.co.nz/node/2798) **(21)****Alg 7/8** [**Graphic Details**](https://nzmaths.co.nz/node/2610) **(22)**[**Alg 7/8 Scooting**](https://nzmaths.co.nz/node/13529) **(24)****Alg 7/8 4.2** [**Hine’s Spreadsheets**](https://nzmaths.co.nz/node/2685) **(14)****Alg 7/8 4.2** [**Parking Fees**](https://nzmaths.co.nz/node/2689) **(17)****Alg 7/8 4.2** [**Changing Tyres**](https://nzmaths.co.nz/node/2697) **(24)****Alg 7/8 4.3** [**Save Some, Spend Some**](https://nzmaths.co.nz/node/2714) **(1)****Alg 7/8 4.3** [**Kidding Around**](https://nzmaths.co.nz/node/2719) **(8)****Alg 7/8 4.3** [**Stepping Stones**](https://nzmaths.co.nz/node/2720) **(9)****Alg 7/8 4.3** [**Patterns, Rules And Spreadsheets**](https://nzmaths.co.nz/node/2728) **(20)****Alg 7/8 4.3** [**Car Journey**](https://nzmaths.co.nz/node/13527) **(22)****Alg 7/8 4.3** [**Surfboard Sums**](https://nzmaths.co.nz/node/13528) **(23)****Alg 7/8 4.3** [**Holiday Pay**](https://nzmaths.co.nz/node/2729) **(24)** |
| Model situations with equations, and expressions, and find missing unknowns in the equations. | ***Figure It Out*****Alg 3** [**Preparing For The Hāngi**](https://nzmaths.co.nz/node/2566) **(8)****Alg 3** [**Putting Pens To Paper**](https://nzmaths.co.nz/node/2582) **(20)****Alg 3-4** [**Delicatessen Mathematics**](https://nzmaths.co.nz/node/2604) **(12)****Alg 3-4** [**Stacks Of Money**](https://nzmaths.co.nz/node/2609) **(19)****Alg 3-4** [**Domino Delight**](https://nzmaths.co.nz/node/2612) **(21)****Alg 3-4** [**Cup Capers**](https://nzmaths.co.nz/node/2615) **(22)****Alg 3-4** [**Number Tricks**](https://nzmaths.co.nz/node/2620) **(24)****Alg 7/8 L1** [**Thinking Ahead**](https://nzmaths.co.nz/node/2786) **(9)****Alg 7/8 L1** [**Vedic Digits**](https://nzmaths.co.nz/node/2788) **(10)****Alg 7/8 L1** [**Digit Chains**](https://nzmaths.co.nz/node/2695) **(16)****Alg 7/8 L1** [**Pizza Order**](https://nzmaths.co.nz/node/2794) **(17)****Alg 7/8 4.2** [**Number Crunching**](https://nzmaths.co.nz/node/2677) **(4)****Alg 7/8 4.2** [**Table Tennis**](https://nzmaths.co.nz/node/2679) **(8)****Alg 7/8 4.2** [**Up The Garden Path**](https://nzmaths.co.nz/node/2681) **(9)****Alg 7/8 4.2** [**An Artist’s Delight**](https://nzmaths.co.nz/node/2683) **(12)****Alg 7/8 4.2** [**Pegged Out**](https://nzmaths.co.nz/node/2684) **(13)****Alg 7/8 4.2** [**Fish and Chips**](https://nzmaths.co.nz/node/2687) **(15)****Alg 7/8 4.2** [**Digit Chains**](https://nzmaths.co.nz/node/2695) **(21)****Alg 7/8 4.2** [**Number Puzzles**](https://nzmaths.co.nz/node/2696) **(22)****Alg 7/8 4.3** [**Problem Smorgasbord**](https://nzmaths.co.nz/node/2722) **(12)*****nzmaths website*****[Balancing Acts](https://nzmaths.co.nz/node/389)****[Matilda’s Waltz with the 5 Strip Box](https://nzmaths.co.nz/node/390)** |
| Find out whether a number is prime or non-prime, and use primes to find the factors of a number.  | ***Figure It Out*****N 7/8 4.4** [**In Your Prime**](https://nzmaths.co.nz/node/3466) **(1)****N 7/8 4.4** [**Going Bananas**](https://nzmaths.co.nz/node/3467) **(2)****N 7/8 4.4** [**Going to Extraordinary Lengths**](https://nzmaths.co.nz/node/3468) **(4)****N 7/8 4.4** [**Boxing Balls**](https://nzmaths.co.nz/node/3469) **(5)****N 7/8 4.4** [**Prime Sites**](https://nzmaths.co.nz/node/3470) **(6)** |
| Find relationships and patterns in powers and square roots. | ***Figure It Out*****N 7/8 4.4** [**Building Squares**](https://nzmaths.co.nz/node/3479) **(14)****N 7/8 4.4** [**Calculator Power**](https://nzmaths.co.nz/node/3482) **(16)****N 7/8 4.4** [**Cubic Capacity**](https://nzmaths.co.nz/node/3483) **(17)****N 7/8 4.4** [**Growing Pains**](https://nzmaths.co.nz/node/3523) **(18)****N 7/8 4.4** [**Fold and Crease**](https://nzmaths.co.nz/node/3524) **(19)****N 7/8 4.4** [**Pip’s Pay**](https://nzmaths.co.nz/node/3525) **(20)****N 7/8 4.4** [**Starting With Stamps**](https://nzmaths.co.nz/node/3527) **(22)****N 7/8 4.4** [**Superior Side Lengths**](https://nzmaths.co.nz/node/3528) **(24)****N 7/8 4.5** [**Body Mass**](https://nzmaths.co.nz/node/3539) **(10)*****nzmaths website*****[Two’s Company](https://nzmaths.co.nz/node/391)**[**The How and Why of General Terms**](https://nzmaths.co.nz/node/403)**[The Truth About Triangles and Squares](https://nzmaths.co.nz/node/393)** |

***Transition: Advanced Multiplicative to Advanced Proportional Domain: Multiplication and Division***

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| **Strategies being developed** | **References**  |
| Use exponents to solve multiplication problems, including those with areas and volumes | ***Teaching Multiplication and Division (Book 6)***[Powerful Numbers](https://nzmaths.co.nz/node/1027) (73-75)***Teaching Number Sense and Algebraic Thinking***[Squaring](https://nzmaths.co.nz/node/995) (28)[Square Roots](https://nzmaths.co.nz/node/994) (29)[Cubes and Cube Roots](https://nzmaths.co.nz/node/998) (30)***Figure It Out***N3-4.1 [Using Exponents](https://nzmaths.co.nz/node/3269) (22)N7/8 4.4 [Family Trees](https://nzmaths.co.nz/node/3478) (13)N7/8 4.4 [Building Squares](https://nzmaths.co.nz/node/3479) (14)N7/8 4.6 [Powerful Thought](https://nzmaths.co.nz/node/3556) (4)N7/8 4.6 [Factor Towers](https://nzmaths.co.nz/node/3560) (7)N7/8 4.6 [Tiling Teasers](https://nzmaths.co.nz/node/3561) (8)N7/8 4.6 [Alien Counting](https://nzmaths.co.nz/node/3568) (12)N7/8 4.6 [Alien Bacteria](https://nzmaths.co.nz/node/3580) (20) |
| Solve missing factor problems by reversing,e.g. 263 ? = 456 by456 263 = ? | ***Teaching Number Sense and Algebraic Thinking (Book 8)***[***Reversals for Multiplication and Division***](https://nzmaths.co.nz/node/993) ***(10)*** |
|
| Use estimation to check the answers to multiplication and division problems. | ***Teaching Number Sense and Algebraic Thinking (Book 8)***[***Checking Multiplication by Estimation***](https://nzmaths.co.nz/node/973) ***(11)***[***Checking Division by Estimation***](https://nzmaths.co.nz/node/958) ***(11)******Figure It Out******N 3-4*** [***Hard Times***](https://nzmaths.co.nz/node/3262) ***(15)******N 3-4*** [***Multiplication Roundabouts***](https://nzmaths.co.nz/node/3263) ***(16)******BF 3-4*** [***Trying Times***](https://nzmaths.co.nz/node/2904) ***(2)******BF 3-4*** [***Eleventh Heaven***](https://nzmaths.co.nz/node/2905) ***(3)******BF 3-4*** [***Napier’s Bones***](https://nzmaths.co.nz/node/2910) ***(8-9)******N 7/8 L 2*** [***Planting with the Whānau***](https://nzmaths.co.nz/node/3374) ***(6-7)******N 7/8 L 2*** [***Fun Times***](https://nzmaths.co.nz/node/3379) ***(13)******N 7/8 L 2*** [***Divisive Tactics***](https://nzmaths.co.nz/node/3409) ***(14)******NS 7/8 1 L*** [***It pays to win***](https://nzmaths.co.nz/node/4198) ***(18)******NS 7/8 1 L*** [***Grocery Grapplers***](https://nzmaths.co.nz/node/4200) ***(20)******NS 7/8 1 L*** [***Division Dilemmas***](https://nzmaths.co.nz/node/4206) ***(24)******NS&AT3.2*** [***Pizza Split***](https://nzmaths.co.nz/node/4122) ***(6-7)******N3*** [***Standing Room Only***](https://nzmaths.co.nz/node/3148) ***(4)******N 3-4*** [***Division Delights***](https://nzmaths.co.nz/node/3265) ***(18)******N 3-4*** [***Digital Dilemmas***](https://nzmaths.co.nz/node/3266) ***(19)*** |
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***Transition: Advanced Multiplicative to Advanced Proportional Domain: Proportions and Ratios***

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| **Strategies being developed** | **References**  |
| Find equivalent ratios by identifying common whole number factors and express them as fractions and percentages (ratios),e.g. 16:48 is equivalent to 2:6 or 1:3 (8 and 16 as common factors), 1:3 means or 25 % | ***Teaching Fractions, Decimals and Percentages (Book 7)***Introduction (53-56)[Extending Hotshots](https://nzmaths.co.nz/node/1114) (56-60)[Extending Mixing Colours](https://nzmaths.co.nz/node/1115) (61-62)***Figure It Out***PR 3-4.1 [Top Shoot](https://nzmaths.co.nz/node/4745) (24)PR 3-4.2 [Flavoursome](https://nzmaths.co.nz/node/4761) (6)PR 3-4.1 [da Vinci’s Ratio](https://nzmaths.co.nz/node/4775) (24) |
| Add and subtract fractions and mixed numbers with uncommon denominators, e.g. + = = 1 | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Comparing Apples with Apples***](https://nzmaths.co.nz/node/967) ***(65-67)******Figure It Out******NS&AT 3-4.1*** [***Stripping Fractions***](https://nzmaths.co.nz/node/4154) ***(8)*** |
| Solve problems that involve multiplying fractions and dividing whole numbers by fractions, recognising that division can result in a larger answer,e.g. 4 ÷ = ÷ = 6 | ***Teaching Number sense and Algebraic Thinking (Book 8)***[***Harder Division of Fractions***](https://nzmaths.co.nz/node/992) ***(22)***[***When Small Gets Bigger***](https://nzmaths.co.nz/node/996) ***(24)*** |
| Solve problems that involve multiplying and dividing decimals using place value estimation and conversion to known fractions, e.g.0.4 × 2.8 = 1.12 (0.4<)8.1 ÷ 0.3 = 27 (81÷ 3 in tenths) | ***Teaching Fractions, Decimals and Percentages (Book7)***[***Folding Fractions and Decimals***](https://nzmaths.co.nz/node/1021) ***(63-64)******Teaching Number sense and Algebraic Thinking (Book 8)***[***Estimation in Decimal Multiplication and Division Problems***](https://nzmaths.co.nz/node/990) ***(25)***[***Multiplication of Decimal Fractions***](https://nzmaths.co.nz/node/988) ***(37)******Figure It Out******N 3-4.2*** [***Spring Fever***](https://nzmaths.co.nz/node/3288) ***(6)******N 3-4.2*** [***Ageing in Space***](https://nzmaths.co.nz/node/3289) ***(8)******N3-4.2*** [***Meal Deal***](https://nzmaths.co.nz/node/3290) ***(9)******N 3-4.3*** [***Dog’s Dinner***](https://nzmaths.co.nz/node/3318) ***(14)******NS@AT 3-4.2*** [***Using Mates***](https://nzmaths.co.nz/node/4175) ***(16)******NS&AT 3-4.2*** [***Compatible Multiples***](https://nzmaths.co.nz/node/4179) ***(21)******NS&AT7/8 4.2*** [***Astronomical Proportions***](https://nzmaths.co.nz/node/4224) ***(16)******NS 7/8 4.2*** [***Line Up***](https://nzmaths.co.nz/node/4227) ***(20)******N 7/8 4.5*** [***Body Mass***](https://nzmaths.co.nz/node/3539) ***(10)******N 7/8 4.6*** [***Accident-prone***](https://nzmaths.co.nz/node/3565) ***(11)*** |
| Solve problems with rates using common whole number factors and convertion to unit rates, e.g. 490 km in 14 hours is an average speed of 35 k/h (dividing by 7 then 2). | ***Teaching Fractions, Decimals and Percentages (Book7)***[***Rates of Change***](https://nzmaths.co.nz/node/1117) ***(71-75)******Figure It Out******NS 7/8 4.2*** [***Fair Exchanges***](https://nzmaths.co.nz/node/4221) ***(13)******NS 7/8 4.2*** [***Energy Levels***](https://nzmaths.co.nz/node/4222) ***(14)******N 7/8 4.3*** [***Cycling On…***](https://nzmaths.co.nz/node/3437) ***(20)******N 7/8 4.5*** [***Dreaming of Millions***](https://nzmaths.co.nz/node/3538) ***(9)******PR 3-4.1 The Caves of Koor******PR 3-4.1*** [***Running Hot and Cold***](https://nzmaths.co.nz/node/4757) ***(1)******PR 3-4.2*** [***Deb the Driver***](https://nzmaths.co.nz/node/4759) ***(2)******PR 3-4.2*** [***Pay Rates***](https://nzmaths.co.nz/node/4769) ***(17)*** |
| Solve division problems that have fraction answers and express the remainder as a whole number, fraction or decimal appropriate to the problem, e.g. 19 ÷ 8 = 2r3 or 2or 2.375. | ***Teaching Number sense and Algebraic Thinking (Book 8)***[***Finding Remainders***](https://nzmaths.co.nz/node/1127) ***(31)***[***Applying Remainders***](https://nzmaths.co.nz/node/1128) ***(32)*** |
| Combine and partition ratios, and express the resulting ratio using fractions and percentages, e.g. Tina twice as many marbles as Ben. She has a ratio of 2 steelies to 5 milkies. Ben’s ratio is 3:4.If they combine their collections what will the ratio be?i.e. 2:5 2:5 3:4 = 7:14 = 1:2 | ***Teaching Number sense and Algebraic Thinking (Book 8)***[***Sharing in Ratios***](https://nzmaths.co.nz/node/986) ***(43)***[***Ratios with Whole Numbers***](https://nzmaths.co.nz/node/985) ***(42)******Figure It Out******PR 3-4.1*** [***The Right Mix***](https://nzmaths.co.nz/node/4744) ***(22)*** |
| Find fractions between two given fractions using equivalence, conversion to decimals or percentages, and proximity to benchmark fractions,e.g. < <, = . | ***Teaching Fractions, Decimals and Percentages (Book7)***[***Feeding Pets***](https://nzmaths.co.nz/node/1023) ***(67-68)******Figure It Out******NS&AT 3-4.1*** [***Fishy Fractions***](https://nzmaths.co.nz/node/4161) ***(16)******PR 3-4.2*** [***Just Right***](https://nzmaths.co.nz/node/4762) ***(8)******PR 3-4.2*** [***Fruit Proportions***](https://nzmaths.co.nz/node/4742) ***(20)******PR 3-4.2*** [***Ratio Rip***](https://nzmaths.co.nz/node/4764) ***(10)******PR 3-4.2*** [***Laser Blazer***](https://nzmaths.co.nz/node/4765) ***(12)*** |
| Solve measurement problems with fractions by using equivalence and reunitising the whole (one),e.g. ÷ = ÷ = = 1 lots of two thirds. | ***Teaching Fractions, Decimals and Percentages (Book 7)***[***Brmmm! Brmmm!***](https://nzmaths.co.nz/node/1116) ***(68-71)*** |
| Solve percentage change problems, e.g.The house price rises from $240,000 to $270,000. The increase is = = = = 12.5% | ***Teaching Number sense and Algebraic Thinking (Book 8)***[***Calculating Percentage Changes***](https://nzmaths.co.nz/node/981) ***(26)***[***Estimating Percentages***](https://nzmaths.co.nz/node/1013) ***(26)******Figure It Out******NS 7/8.2*** [***Gains and Losses***](https://nzmaths.co.nz/node/4229) ***(21)*** |

***Transition: Advanced Multiplicative to Advanced Proportional Domain: Algebra***

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| **Strategies being developed** | **References**  |
| Find general rules for finding any member of a repeating, sequential pattern, and record the rule algebraically,e.g. In the sequence 5, 8, 11, 14, 17,…the *n*th number is given by 3*n* + 2.Solving 101 = 3*n* + 2 will tell what term in the sequence is 101.  | **T*eaching Number Through Measurement, Geometry, Algebra, And Statistics (Book 9)***[Sticky Moments](https://nzmaths.co.nz/node/2520) (34-38)***Figure It Out***Alg 3-4 [Stacking Patterns](https://nzmaths.co.nz/node/2592) (3)Alg 3-4 [Bits and Pieces](https://nzmaths.co.nz/node/3369) (5)Alg 3-4 [Animal Antics](https://nzmaths.co.nz/node/4174) (8)Alg 3-4 [Ten-Storey Thomas](https://nzmaths.co.nz/node/2600) (9)Alg 3-4 [Seeing Dots](https://nzmaths.co.nz/node/2603) (11)Alg 7/8 4.2 [The Power of 2](https://nzmaths.co.nz/node/2691) (18)Alg 7/8 4.3 [Design Day](https://nzmaths.co.nz/node/2718) (6)Alg 7/8 4.3 [Frieze](https://nzmaths.co.nz/node/2724) (14)Alg 7/8 4.3 [Web Circles](https://nzmaths.co.nz/node/2726) (18)Alg 7/8 4.3 [Marooned](https://nzmaths.co.nz/node/2727) (19)Alg 7/8 4.4 [Bathroom Tiles](https://nzmaths.co.nz/node/2753) (8)Alg 7/8 4.4 [Patterns and Designs](https://nzmaths.co.nz/node/2755) (10)Alg 7/8 4.4 [Tiling Spacecraft](https://nzmaths.co.nz/node/2761) (13)Alg 7/8 4.4 [Domino Stacks](https://nzmaths.co.nz/node/2764) (14)Alg 7/8 4.4 [Counting Cubes](https://nzmaths.co.nz/node/2765) (15) |
| Use a variety of approaches, including making tables (spreadsheets), creating graphs, and solving equations, to find unknowns from a pattern or relationship.  | ***Figure It Out*****N 7/8 4.6** [**Number Returns**](https://nzmaths.co.nz/node/3559) **(6)****N 7/8 4.6** [**Pascal’s Patterns**](https://nzmaths.co.nz/node/3563) **(9)****Alg 7/8 4.2** [**Island Roads**](https://nzmaths.co.nz/node/2688) **(16)****Alg 7/8 4.3** [**Kidding Around**](https://nzmaths.co.nz/node/2719) **(8)****Alg 7/8 4.3** [**Stepping Stones**](https://nzmaths.co.nz/node/2720) **(9)****Alg 7/8 4.3** [**Web Circles**](https://nzmaths.co.nz/node/2726) **(18)****Alg 7/8 4.3** [**Marooned**](https://nzmaths.co.nz/node/2727) **(19)****Alg 7/8 4.3** [**Car Journeys**](https://nzmaths.co.nz/node/13527) **(22)****Alg 7/8 4.3** [**Surfboard Sums**](https://nzmaths.co.nz/node/13528) **(23)****Alg 7/8 4.3** [**Holiday Pay**](https://nzmaths.co.nz/node/2729) **(24)****Alg 7/8 4.4** [**Calendars And Short Cuts**](https://nzmaths.co.nz/node/2749) **(2)****Alg 7/8 4.4** [**Number Juggling**](https://nzmaths.co.nz/node/2751) **(4)****Alg 7/8 4.4** [**From One To Another**](https://nzmaths.co.nz/node/2768) **(16)****Alg 7/8 4.4** [**Areas of Interest**](https://nzmaths.co.nz/node/2770) **(17)****Alg 7/8 4.4** [**Mats, Patterns, Rules**](https://nzmaths.co.nz/node/2775) **(18)****Alg 7/8 4.4** [**Rotten Apples**](https://nzmaths.co.nz/node/2776) **(20)****Alg 7/8 4.4** [**Suspended Thought**](https://nzmaths.co.nz/node/2777) **(22)****Alg 7/8 4.4** [**Jam Jars**](https://nzmaths.co.nz/node/2778) **(24)*****nzmaths website*****[Holistic Algebra](https://nzmaths.co.nz/node/396)****[Linear Graphs And Patterns](https://nzmaths.co.nz/node/401)****[All Shapes and Sizes](https://nzmaths.co.nz/node/404)****[Fences and Posts](https://nzmaths.co.nz/node/425)****[Arithmagons](https://nzmaths.co.nz/node/399)**[**Fibonacci**](https://nzmaths.co.nz/node/400)**[Magic Squares](https://nzmaths.co.nz/node/395)****[Beanies](https://nzmaths.co.nz/node/402)** |
| Solve problems by finding the prime factors of numbers. | ***Figure It Out******N 7/8 4.4*** [***Igloo Iceblocks***](https://nzmaths.co.nz/node/3471) ***(7)******N 7/8 4.6*** [***Digital Delights***](https://nzmaths.co.nz/node/2891) ***(2)******N 7/8 4.6*** [***Factor Towers***](https://nzmaths.co.nz/node/3560) ***(7)*** |
| Solve problems the involve exponents and square roots. | ***Figure It Out******N 7/8 4.6*** [***Powerful Thought***](https://nzmaths.co.nz/node/3556) ***(4)******N 7/8 4.6*** [***Sunburst***](https://nzmaths.co.nz/node/3558) ***(5)******N 7/8 4.6*** [***Tiling Teasers***](https://nzmaths.co.nz/node/3561) ***(8)******N 7/8 4.6*** [***Squaring Off***](https://nzmaths.co.nz/node/3573) ***(18)******N 7/8 4.6*** [***Alien Bacteria***](https://nzmaths.co.nz/node/3580) ***(20)******Alg 7/8 4.2*** [***The Power of 2***](https://nzmaths.co.nz/node/2691) ***(18)******Alg 7/8 4.4*** [***Square Number Differences***](https://nzmaths.co.nz/node/2746) ***(1)******Alg 7/8 4.4*** [***Alien Critters***](https://nzmaths.co.nz/node/2756) ***(12)******nzmaths website******[All Shapes and Sizes](https://nzmaths.co.nz/node/404)***[***Tilted Squares and Triangles***](https://nzmaths.co.nz/node/398) |
| Find factorials and use factorials to solve problems,e.g. 4! = 1 × 2 × 3 × 4 | ***Figure It Out******N 7/8 4.5*** [***Four 4s***](https://nzmaths.co.nz/node/4214) ***(5)******N 7/8 4.5*** [***Plant Patterns***](https://nzmaths.co.nz/node/10794) ***(12)******Alg 7/8 4.2*** [***An Artist’s Delight***](https://nzmaths.co.nz/node/2683) ***(12)*** |