Transition: Advanced Multiplicative to Advanced Proportional   Domain: Algebraic Thinking

Achievement Objectives	Number: Level Five	Algebra: Level Five
	Number Strategies and Knowledge AO2: Use prime numbers, common factors and multiples, and powers [including square roots]. Number Strategies and Knowledge AO3: Understand operations on fractions, decimals, percentages, and integers.	Patterns and Relationships AO2: Relate tables, graphs and equations to linear and simple quadratic relationships found in number and spatial patterns.

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 nth number is given by $3n + 2$. Solving $101 = 3n + 2$ will tell what term in the sequence is 101.	*Teaching Number Through Measurement, Geometry, Algebra, And Statistics (Book 9)* Sticky Moments (34-38) *Figure It Out* Alg 3-4 Stacking Patterns (3) Alg 3-4 Bits and Pieces (5) Alg 3-4 Animal Antics (8) Alg 3-4 Ten-Storey Thomas (9) Alg 3-4 Seeing Dots (11) Alg 7/8 4.2 The Power of 2 (18) Alg 7/8 4.3 Design Day (6) Alg 7/8 4.3 Frieze (14) Alg 7/8 4.3 Web Circles (18) Alg 7/8 4.3 Marooned (19) Alg 7/8 4.4 Bathroom Tiles (8) Alg 7/8 4.4 Patterns and Designs (10) Alg 7/8 4.4 Tiling Spacecraft (13) Alg 7/8 4.4 Domino Stacks (14) Alg 7/8 4.4 Counting Cubes (15)

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Strategies being developed	References
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 (6) N 7/8 4.6 Pascal's Patterns (9) Alg 7/8 4.2 Island Roads (16) Alg 7/8 4.3 Kidding Around (8) Alg 7/8 4.3 Stepping Stones (9) Alg 7/8 4.3 Web Circles (18) Alg 7/8 4.3 Marooned (19) Alg 7/8 4.3 Car Journeys (22) Alg 7/8 4.3 Surfboard Sums (23) Alg 7/8 4.3 Holiday Pay (24) Alg 7/8 4.4 Calendars And Short Cuts (2) Alg 7/8 4.4 Number Juggling (4) Alg 7/8 4.4 From One To Another (16) Alg 7/8 4.4 Areas of Interest (17) Alg 7/8 4.4 Mats, Patterns, Rules (18) Alg 7/8 4.4 Rotten Apples (20) Alg 7/8 4.4 Suspended Thought (22) Alg 7/8 4.4 Jam Jars (24) ***nzmaths website*** Holistic Algebra Linear Graphs And Patterns All Shapes and Sizes Fences and Posts Arithmagons Fibonacci Magic Squares Beanies

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Strategies being developed	References
Solve problems by finding the prime factors of numbers.	***Figure It Out*** N 7/8 4.4 Igloo Iceblocks (7) N 7/8 4.6 Digital Delights (2) N 7/8 4.6 Factor Towers (7)
Solve problems the involve exponents and square roots.	***Figure It Out*** N 7/8 4.6 Powerful Thought (4) N 7/8 4.6 Sunburst (5) N 7/8 4.6 Tiling Teasers (8) N 7/8 4.6 Squaring Off (18) N 7/8 4.6 Alien Bacteria (20) Alg 7/8 4.2 The Power of 2 (18) Alg 7/8 4.4 Square Number Differences (1) Alg 7/8 4.4 Alien Critters (12) ***nzmaths website*** All Shapes and Sizes Tilted Squares and Triangles
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 (5) N 7/8 4.5 Plant Patterns (12) Alg 7/8 4.2 An Artist's Delight (12)

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