## Transition: Advanced Additive to Advanced Multiplicative

### Domain: Algebraic Thinking

<table>
<thead>
<tr>
<th>Achievement Objectives</th>
<th>Algebra: Level Four</th>
<th>Number: Level Five</th>
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<tbody>
<tr>
<td>Patterns and Relationships AO2:</td>
<td>Use graphs, tables, and rules to describe linear relationships found in number and spatial patterns.</td>
<td>Use prime numbers, common factors and multiples, and powers [including square roots].</td>
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<tr>
<td>Equations and Expressions AO1</td>
<td>Form and solve simple linear equations.</td>
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### Strategies being developed

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 $10 \times 4 - 1 = 39$.

### References

- **Teaching Number through Measurement, Geometry, Algebra, and Statistics (Book 9)**
  - Sticky Moments (34-38)

- **Figure It Out**
  - Alg 3 Pattern Predictions (1)
  - Alg 3 Duncan’s Day (17)
  - Alg 3 Puzzling Patterns (16)
  - Alg 3-4 All Square (2)
  - Alg 3-4 Where to Sit (4)
  - Alg 3-4 Waka Widths (6)
  - Alg 3-4 Patterns and Rules (16)
  - Alg 7/8 L1 Building Borders (12)
  - Alg 7/8 L1 Tiling Teasers (18)
  - Alg 7/8 4.2 Which DJ? (1)
  - Alg 7/8 4.2 Straw Chains (2)
  - Alg 7/8 4.2 Bailey Bridges (6)
  - Alg 7/8 4.2 Stapled (10)
  - Alg 7/8 4.3 Table Mats (2)
  - Alg 7/8 4.3 Stacking Up (4)
  - Alg 7/8 4.3 Stick Houses (16)

- **nzmaths website**
  - You can Count on Squares
  - Tukutuku Panels
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| Interpret and identify relationships in tables and graphs. | **Teaching Number Through Measurement, Geometry, Algebra, And Statistics (Book 9)**  
  **Sticky Moments** (34-38)  

**Figure It Out**  
Alg 3 **Spreadsheet Challenge** (2)  
Alg 3 **Possum Poles** (6)  
Alg 3 **Ups and Downs** (9)  
Alg 3-4 **Tongan Travel** (14)  
Alg 3-4 **Graphic Details** (20)  
Alg 7/8 L1 **Cube Signs** (4)  
Alg 7/8 **Fencing** (6)  
Alg 7/8 **Patterns and Spreadsheets** (14)  
Alg 7/8 **Whānau Photo** (21)  
Alg 7/8 **Graphic Details** (22)  
Alg 7/8 **Scooting** (24)  
Alg 7/8 4.2 **Hine’s Spreadsheets** (14)  
Alg 7/8 4.2 **Parking Fees** (17)  
Alg 7/8 4.2 **Changing Tyres** (24)  
Alg 7/8 4.3 **Save Some, Spend Some** (1)  
Alg 7/8 4.3 **Kidding Around** (8)  
Alg 7/8 4.3 **Stepping Stones** (9)  
Alg 7/8 4.3 **Patterns, Rules And Spreadsheets** (20)  
Alg 7/8 4.3 **Car Journey** (22)  
Alg 7/8 4.3 **Surfboard Sums** (23)  
Alg 7/8 4.3 **Holiday Pay** (24) |
### Strategies being developed

Model situations with equations, and expressions, and find missing unknowns in the equations.

### References

#### Figure It Out
- Alg 3 *Preparing For The Hāngi* (8)
- Alg 3 *Putting Pens To Paper* (20)
- Alg 3-4 *Delicatessen Mathematics* (12)
- Alg 3-4 *Stacks Of Money* (19)
- Alg 3-4 *Domino Delight* (21)
- Alg 3-4 *Cup Capers* (22)
- Alg 3-4 *Number Tricks* (24)
- Alg 7/8 L1 *Thinking Ahead* (9)
- Alg 7/8 L1 *Vedic Digits* (10)
- Alg 7/8 L1 *Digit Chains* (16)
- Alg 7/8 L1 *Pizza Order* (17)
- Alg 7/8 4.2 *Number Crunching* (4)
- Alg 7/8 4.2 *Table Tennis* (8)
- Alg 7/8 4.2 *Up The Garden Path* (9)
- Alg 7/8 4.2 *An Artist's Delight* (12)
- Alg 7/8 4.2 *Pegged Out* (13)
- Alg 7/8 4.2 *Fish and Chips* (15)
- Alg 7/8 4.2 *Digit Chains* (21)
- Alg 7/8 4.2 *Number Puzzles* (22)
- Alg 7/8 4.3 *Problem Smorgasbord* (12)

#### nzmaths website
- *Balancing Acts*
- *Matilda's Waltz with the 5 Strip Box*
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| 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* (1)  
N 7/8 4.4 *Going Bananas* (2)  
N 7/8 4.4 *Going to Extraordinary Lengths* (4)  
N 7/8 4.4 *Boxing Balls* (5)  
N 7/8 4.4 *Prime Sites* (6) |
| Find relationships and patterns in powers and square roots. | **Figure It Out**  
N 7/8 4.4 *Building Squares* (14)  
N 7/8 4.4 *Calculator Power* (16)  
N 7/8 4.4 *Cubic Capacity* (17)  
N 7/8 4.4 *Growing Pains* (18)  
N 7/8 4.4 *Fold and Crease* (19)  
N 7/8 4.4 *Pip’s Pay* (20)  
N 7/8 4.4 *Starting With Stamps* (22)  
N 7/8 4.4 *Superior Side Lengths* (24)  
N 7/8 4.5 *Body Mass* (10) |

**nzmaths website**  
*Two’s Company*  
*The How and Why of General Terms*  
*The Truth About Triangles and Squares*