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

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| **Achievement Objectives** | **Number: Level 3** | **Number: Level 4** |
| Number Knowledge AO1  Know basic multiplication and division facts.  Number Knowledge AO3:  Know how many tenths, tens, hundreds, and thousands are in whole numbers. | Number Strategies and Knowledge AO1  Use a range of multiplicative strategies when operating on whole numbers. |

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| **Strategies being developed** | **Problem progression** | **References** | **Knowledge being developed** | **Resources** |
| Use standard place value to solve multiplication problems (distributive property) | 3 × 44 = 🞏  as 3 × 40 + 3 × 4  7 × 27 = 🞏  as 7 × 20 + 7 × 7  9 × 53 = 🞏  as 9 × 50 + 9 × 3  8 × 36 = 🞏  as 8 × 30 + 8 × 6  4 × 217 = 🞏  as 4 × 200 + 4 × 10 + 4 × 7 | ***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) | Recall the number of groupings of tens, hundreds, and thousands that can be made from a number of up to seven digits. | ***Teaching Number Knowledge (Book 4)***  [Tens in Hundreds and More](https://nzmaths.co.nz/node/1082) (27)  [Zap](https://nzmaths.co.nz/node/1081) (26)  [Using Calculators](https://nzmaths.co.nz/node/1059) (14) |

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| **Strategies being developed** | **Problem progression** | **References** | **Knowledge being developed** | **Resources** |
| Use tidy numbers to solve multiplication problems (distributive property) | 4 × 26 = 🞏  as 4 × 25 + 4 × 1  6 × 99 = 🞏  as 6 × 100 - 6 × 1  7 × 48 = 🞏  as 7 × 50 - 7 × 2  8 × 47 = 🞏  as 8 × 50 - 8 × 3  6 × 248 = 🞏  as 6 × 250 - 6 × 2 | ***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) | Recall multiplication and division facts to 10 x 10, and the corresponding division facts | ***Teaching Number Knowledge (Book 4)***  [Dividing? Think About Multiplying First](https://nzmaths.co.nz/node/1099) (37)  [Multiplication Flash Cards](https://nzmaths.co.nz/node/1100) (38)  [Loopy](https://nzmaths.co.nz/node/1097) (37)  [Multiplication Madness](https://nzmaths.co.nz/node/1096) (36)  [In and Out](https://nzmaths.co.nz/node/1095) (36)  [Bowl a Fact](https://nzmaths.co.nz/node/1094) (35)  [Beep](https://nzmaths.co.nz/node/1056) (12)  ***Figure It Out***  BF 2-3 [Dicing Times](https://nzmaths.co.nz/node/2819) (2)  BF 2-3 [Sticky Problem](https://nzmaths.co.nz/node/2874) (20)  BF 2-3 [Loopy](https://nzmaths.co.nz/node/1097) (23)  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 [Almost Squares](https://nzmaths.co.nz/node/2893) (15)  BF 3 [Multiple Mirrors](https://nzmaths.co.nz/node/2897) (21)  BF 3-4 (10) [Matrix](https://nzmaths.co.nz/node/2911)  N 2-3 [High Flyers](https://nzmaths.co.nz/node/3123) (14)  N 2-3 [Wheel and Deal](https://nzmaths.co.nz/node/3124) (15)  N 3.2 [Movie Maths](https://nzmaths.co.nz/node/3205) (6)  N 3.3 [Easy Nines](https://nzmaths.co.nz/node/3238) (14)  N 7/8 4.3 [Cover Up](https://nzmaths.co.nz/node/3426) (9)  N 7/8 4.5 [Remainder Bingo](https://nzmaths.co.nz/node/3530) (2) |

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| **Strategies being developed** | **Problem progression** | **References** | **Knowledge being developed** | **Resources** |
| Use proportional adjustment like doubling and halving, thirding and trebling, to solve multiplication problems | 4×6 = 🞏 so 2× 🞏 =24,  8 × 3 = 24  12×10 = 🞏 so 🞏×5 = 120 and 6×🞏 = 120  9×8 = 🞏 so 3 ×🞏 = 72,  🞏 × 4 = 72  4 × 16 = 🞏 from 8 × 8  468 × 5 =🞏 from 234 × 10  18 × 33 =🞏 from 6 × 99 | ***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) | Recall the groupings of numbers to 10 that are in numbers to 100 and finds the resulting remainders e.g. sixes in 38 |  |
| Use standard place value to solve division problems, including written forms,  e.g. 8 | 96 ÷ 4 = 🞏 as 80 ÷ 4 = 20 and 16 ÷ 4 = 4  135 ÷ 5 = 🞏 as 100 ÷ 5 = 20 and 35 ÷ 5 = 7  189 ÷ 3 = 🞏 as 180 ÷ 3 = 60 and 9 ÷ 3 = 3  414 ÷ 9 = 🞏 as 360 ÷ 9 = 40 and 54 ÷ 9 = 6  296 ÷ 8 = 🞏 as 240 ÷ 8 = 30 and 56 ÷ 8 = 7  318 ÷ 6 = 🞏 as 300 ÷ 6 = 50 and 18 ÷ 6 = 3 | ***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) | Carry out a short written algorithm for multiplication and division of a three-digit whole number by a single-digit number | ***Figure It Out***  N 3-4.2 [Oceans Apart](https://nzmaths.co.nz/node/3286) (4)  N 7/8 4.3 [Frantic Fund-raising](https://nzmaths.co.nz/node/3424) (7) |

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| **Strategies being developed** | **Problem progression** | **References** |
| Use standard place value with tidy numbers to solve division problems | 96 ÷ 4 =🞏  from 100 ÷ 4 = 25  162 ÷ 3 = 🞏  from 180 ÷ 3 = 60  476 ÷ 7 = 🞏  from 490 ÷ 7 = 70  616 ÷ 8 = 🞏  from 640 ÷ 8 = 80   * 792 ÷ 9 = 🞏 * from 810 ÷ 9 = 90 | ***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 | 4 × 44 = 🞏 as 2 × 2 × 44  8 × 57 = 🞏 as 2 × 2 × 2 × 57  12 × 23 = 🞏 as 2 × 2 × 3 × 23  72 ÷ 4 = 🞏 as 72 ÷ 2 ÷ 2 = 🞏  184 ÷ 8 = 🞏 as 184 ÷ 2 ÷ 2 ÷ 2 = 🞏  396 ÷ 6 = 🞏 as 396 ÷ 3 ÷ 2 = 🞏 | ***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.) | 52 ÷ 4 = 🞏 as  26 ÷ 2 = 🞏  208 ÷ 8 = 🞏 as 104 ÷ 4 = 🞏, 52 ÷ 2 = 🞏  408 ÷ 12 = 🞏 as 204 ÷ 6 = 🞏, 102 ÷ 3 = 🞏  378 ÷ 27 = 🞏 as 42 ÷ 3 = 🞏 | ***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 | 24 ÷ 4 = 6 so 24 ÷ 8 = 🞏, 24 ÷ 2 = 🞏  40 ÷ 10 = 4 from 40 ÷ 5 =🞏, 40 ÷ 20 = 🞏  72 ÷ 9 = 8 so 72 ÷ 3 = 🞏, 72 ÷ 18 = 🞏  56 ÷ 8 = 7 so 56 ÷ 16 = 🞏, 56 ÷ 4 = 🞏  1000 ÷ 2 = 500 so 1000 ÷ 4 = 🞏, 1000 ÷ 8 = 🞏 | ***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) |

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| **Strategies being developed** | **Problem progression** | **References** |
| Use place value units to solve multiplication and division problems, including written multiplication algorithms,  e.g. 34  × 26 | 10 × 20 = 200 so 14 × 23 = 🞏  20 × 40 = 800 so 23 × 47 = 🞏  50 × 40 = 2000 so 53 × 46 = 🞏  900 ÷ 30 = 30 so 1080 ÷ 30 = 🞏  4000 ÷ 80 = 50 so 3840 ÷ 80 = 🞏  10 000 ÷ 100 = 100 so 10 000 ÷ 25 = 🞏 | ***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 | 35 ÷ 2 = 🞏 from 34 ÷ 2 = 17  78 ÷ 5 = 🞏 from 75 ÷ 5 = 15  67 ÷ 4 = 🞏 from 64 ÷ 4 = 16  53 ÷ 3 = 🞏 from 51 ÷ 3 = 17  205 ÷ 8 = 🞏 from 200 ÷ 8 = 25  486 ÷ 24 = 🞏 from 480 ÷ 24 = 20 | ***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 | Divisible by 4 and 8? 132, 248, 481, 925, 2412, 6664  Divisible by 3 and 9? 72, 144, 267, 496, 1002  Divisible by 6? 108, 243, 522, 963 | ***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) |

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| Anticipate what happens to a number when it is multiplied or divided by ten, one hundred, one thousand, and so on. | ***Teaching Multiplication and Division (Book 6)***  [Sherpa (Tensing)](https://nzmaths.co.nz/node/1112) (43-48) |  |
| 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) |