

Transition: Advanced Additive to Advanced Multiplicative

Domain: Multiplication and Division

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

Strategies being developed	Problem progression	References	Knowledge being developed	Resources
Use standard place value to solve multiplication problems (distributive property)	$3 \times 44 = \square$ as $3 \times 40 + 3 \times 4$ $7 \times 27 = \square$ as $7 \times 20 + 7 \times 7$ $9 \times 53 = \square$ as $9 \times 50 + 9 \times 3$ $8 \times 36 = \square$ as $8 \times 30 + 8 \times 6$ $4 \times 217 = \square$ as $4 \times 200 + 4 \times 10 + 4 \times 7$	<p>Teaching Multiplication and Division (Book 6) Introduction (41-43) Multiplication Smorgasbord (52-54)</p> <p>Figure It Out N3 High Powered Thinking (29) N3.2 Singing up a Storm (7) N3.2 Booked! (8-9) N 3.2 That Old? (12-13) N 3.2 Sweet Thoughts (15) N 3.3 What a View! (12) N 3-4.1 Lookalike (17) N 3-4.3 Dog's Dinner (14) BF3-4 Trying Times (2) BF3-4 Eleventh Heaven (3) NS&AT 4.1 The Greenhouse Effect (9)</p>	Recall the number of groupings of tens, hundreds, and thousands that can be made from a number of up to seven digits.	<p>Teaching Number Knowledge (Book 4) Tens in Hundreds and More (27) Zap (26) Using Calculators (14)</p>

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Use tidy numbers to solve multiplication problems (distributive property)	$4 \times 26 = \square$ as $4 \times 25 + 4 \times 1$ $6 \times 99 = \square$ as $6 \times 100 - 6 \times 1$ $7 \times 48 = \square$ as $7 \times 50 - 7 \times 2$ $8 \times 47 = \square$ as $8 \times 50 - 8 \times 3$ $6 \times 248 = \square$ as $6 \times 250 - 6 \times 2$	<p>Teaching Multiplication and Division (Book 6) Multiplication Smorgasbord (52-54)</p> <p>Figure It Out N3.2 Multiple Methods(10/11) N 3-4.1 Hard Times (15) N 3-4.1 Multiplication Roundabouts (16) NS&AT 3.1 (6-7) What’s Best?</p>	Recall multiplication and division facts to 10 x 10, and the corresponding division facts	<p>Teaching Number Knowledge (Book 4) Dividing? Think About Multiplying First (37) Multiplication Flash Cards (38) Loopy (37) Multiplication Madness (36) In and Out (36) Bowl a Fact (35) Beep (12)</p> <p>Figure It Out BF 2-3 Dicing Times (2) BF 2-3 Sticky Problem (20) BF 2-3 Loopy (23) BF 3 Factor Puzzles (11) BF 3 Stars and Students (12) BF 3 Almost Squares (15) BF 3 Multiple Mirrors (21) BF 3-4 (10) Matrix N 2-3 High Flyers (14) N 2-3 Wheel and Deal (15) N 3.2 Movie Maths (6) N 3.3 Easy Nines (14) N 7/8 4.3 Cover Up (9) N 7/8 4.5 Remainder Bingo (2)</p>

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Use proportional adjustment like doubling and halving, thirding and trebling, to solve multiplication problems	$4 \times 6 = \square$ so $2 \times \square = 24$, $8 \times 3 = 24$ $12 \times 10 = \square$ so $\square \times 5 = 120$ and $6 \times \square = 120$ $9 \times 8 = \square$ so $3 \times \square = 72$, $\square \times 4 = 72$ $4 \times 16 = \square$ from 8×8 $468 \times 5 = \square$ from 234×10 $18 \times 33 = \square$ from 6×99	<p>Teaching Multiplication and Division (Book 6) Cut and Paste (49-51))</p> <p>Teaching Number Sense and Algebraic Thinking (Book 8) Doubling and Halving (14) Multiplying by 25 (14)</p> <p>Figure It Out NS 7/8.1 Double and Halve (11) NS&AT2-3.1 Clean Cars (18-19) NS&AT2-3.2 Fair Mix (11)</p>	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. $\begin{array}{r} 44 \\ 8 \overline{)352} \end{array}$	$96 \div 4 = \square$ as $80 \div 4 = 20$ and $16 \div 4 = 4$ $135 \div 5 = \square$ as $100 \div 5 = 20$ and $35 \div 5 = 7$ $189 \div 3 = \square$ as $180 \div 3 = 60$ and $9 \div 3 = 3$ $414 \div 9 = \square$ as $360 \div 9 = 40$ and $54 \div 9 = 6$ $296 \div 8 = \square$ as $240 \div 8 = 30$ and $56 \div 8 = 7$ $318 \div 6 = \square$ as $300 \div 6 = 50$ and $18 \div 6 = 3$	<p>Teaching Multiplication and Division (Book 6) Paper Power (63-67)</p> <p>Figure It Out N 3.3 Busking Blues (11) N 3.3 Arcade Adventure (18)</p>	Carry out a short written algorithm for multiplication and division of a three-digit whole number by a single-digit number	<p>Figure It Out N 3-4.2 Oceans Apart (4) N 7/8 4.3 Frantic Fund-raising (7)</p>

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Use standard place value with tidy numbers to solve division problems	$96 \div 4 = \square$ from $100 \div 4 = 25$ $162 \div 3 = \square$ from $180 \div 3 = 60$ $476 \div 7 = \square$ from $490 \div 7 = 70$ $616 \div 8 = \square$ from $640 \div 8 = 80$ $792 \div 9 = \square$ from $810 \div 9 = 90$	<p>Teaching Multiplication and Division (Book6) Paper Power (63-67)</p> <p>Figure It Out N 3-4.1 Division Delights (18)</p>
Use splitting by factors to solve multiplication and division problems	$4 \times 44 = \square$ as $2 \times 2 \times 44$ $8 \times 57 = \square$ as $2 \times 2 \times 2 \times 57$ $12 \times 23 = \square$ as $2 \times 2 \times 3 \times 23$ $72 \div 4 = \square$ as $72 \div 2 \div 2 = \square$ $184 \div 8 = \square$ as $184 \div 2 \div 2 \div 2 = \square$ $396 \div 6 = \square$ as $396 \div 3 \div 2 = \square$	<p>Teaching Multiplication and Division (Book 6) Little Bites at Big Multiplications and Divisions (76-79)</p> <p>Figure It Out NS&AT 3-4.1 The Factoring Factory (4)</p>
Simplify division problems by changing both numbers (halving, thirding etc.)	$52 \div 4 = \square$ as $26 \div 2 = \square$ $208 \div 8 = \square$ as $104 \div 4 = \square$, $52 \div 2 = \square$ $408 \div 12 = \square$ as $204 \div 6 = \square$, $102 \div 3 = \square$ $378 \div 27 = \square$ as $42 \div 3 = \square$	<p>Teaching Multiplication and Division (Book 6) The Royal Cooking Lessons (57-60)</p> <p>Teaching Number Sense and Algebraic Thinking (Book 8) Equals Sign Again (12)</p> <p>Figure It Out NS&AT3.2 Horsing Around (11)</p>
Use proportional adjustment to solve division problems	$24 \div 4 = 6$ so $24 \div 8 = \square$, $24 \div 2 = \square$ $40 \div 10 = 4$ from $40 \div 5 = \square$, $40 \div 20 = \square$ $72 \div 9 = 8$ so $72 \div 3 = \square$, $72 \div 18 = \square$ $56 \div 8 = 7$ so $56 \div 16 = \square$, $56 \div 4 = \square$ $1000 \div 2 = 500$ so $1000 \div 4 = \square$, $1000 \div 8 = \square$	<p>Teaching Multiplication and Division (Book 6) Proportional Packets (54-57)</p> <p>Figure It Out NS 7/8 Link Division Dilemmas (24)</p>

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Use place value units to solve multiplication and division problems, including written multiplication algorithms, e.g. $\begin{array}{r} 34 \\ \times 26 \\ \hline \end{array}$	$10 \times 20 = 200$ so $14 \times 23 = \square$ $20 \times 40 = 800$ so $23 \times 47 = \square$ $50 \times 40 = 2000$ so $53 \times 46 = \square$ $900 \div 30 = 30$ so $1080 \div 30 = \square$ $4000 \div 80 = 50$ so $3840 \div 80 = \square$ $10\ 000 \div 100 = 100$ so $10\ 000 \div 25 = \square$	<p>Teaching Multiplication and Division (Book 6) Cross Products (67-69)</p> <p>Figure It Out N3-4.3 (8-9) Number Patterns N3-4.3 (12-13) How Many? N 7/8.3 Orchard Antics (23) N 7/8.5 Plastic Fantastic (17) NS7/8 Link Keep Your Shirt On (23) NS7/8.2 No Space to Spare (18) NS&AT 3-4.1 Tile the Town – Tiny! (20-21)</p>
Solve division problems that involve remainders expressing the remainders as whole numbers, fractions or decimals depending on the context, e.g. $38 \div 4 = 9 \text{ r}2$ or 9.5 or $9\frac{1}{2}$	$35 \div 2 = \square$ from $34 \div 2 = 17$ $78 \div 5 = \square$ from $75 \div 5 = 15$ $67 \div 4 = \square$ from $64 \div 4 = 16$ $53 \div 3 = \square$ from $51 \div 3 = 17$ $205 \div 8 = \square$ from $200 \div 8 = 25$ $486 \div 24 = \square$ from $480 \div 24 = 20$	<p>Teaching Multiplication and Division (Book 6) Remainders (60-62)</p> <p>Figure It Out BF3 It Remains to be Seen (22) N 7/8 4.3 Digit Challenge (18) N7/8 4.5 Revisiting Remainders (1) N7/8 4.5 Remainder Bingo (2) NS&AT3.1 Just Right! (8-9) NS&AT3.2 Triple Trouble (1) N7/8.3 Team Leaders (10)</p>
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	<p>Teaching Multiplication and Division (Book 6) Nines and Threes (70-72)</p> <p>Teaching Number Sense and Algebraic Thinking (Book 8) Divisibility Tests (33)</p> <p>Figure It Out N3.3 (14-15) Easy Nines BF 3 Dicey Dabble (20) NS&AT3-4.1 Digital Dilemmas (19) NS&AT3-4.1 Wheeling And Dealing (22-24) NS 7/8 4.2 Divide and Conquer (2)</p>

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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.	<i>Teaching Multiplication and Division (Book 6)</i> Sherpa (Tensing) (43-48)	
Solve problems using a combination of the four operations, including using the order of operations		<p>Figure It Out</p> <p>BF 3 Making Numbers (24)</p> <p>N 3.1 Dead Calculators (19)</p> <p>N 3.1 Speedy Types (21)</p> <p>N 3.1 Human Pyramids (23)</p> <p>N 3.3 Wheels Galore (19)</p> <p>N 3-4.1 Think Tank (20)</p> <p>N 3-4.2 Oceans Apart (4)</p> <p>N 3-4.2 Food for All (5)</p> <p>N 3-4.3 Number Patterns (8)</p> <p>N3.3 Easy Nines (14-15)</p> <p>N7/8.5 Order of Operations (6)</p> <p>N7/8.5 Operations Checker (7)</p>

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