



# Math Connects

Concepts, Skills, and Problem Solving

Course 2

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STANDARDS	PAGE REFERENCES
<p><b>STANDARD 4.1 (NUMBER AND NUMERICAL OPERATIONS) ALL STUDENTS WILL DEVELOP NUMBER SENSE AND WILL PERFORM STANDARD NUMERICAL OPERATIONS AND ESTIMATIONS ON ALL TYPES OF NUMBERS IN A VARIETY OF WAYS.</b></p>	
<p>Building upon knowledge and skills gained in preceding grades, by the end of <b>Grade 7</b>, students will:</p>	
<p><b>4.1.7 A. Number Sense</b></p>	
<p>1. Extend understanding of the number system by constructing meanings for the following <b>(unless otherwise noted, all indicators for grade 7 pertain to these sets of numbers as well)</b>:</p> <ul style="list-style-type: none"> <li>• Rational numbers</li> <li>• Percents</li> <li>• Whole numbers with exponents</li> </ul>	<p><b>Student Edition:</b> 6-7, 30-33, 80-83, 196-200, 202-205, 206-210, 215-220, 221, 224</p> <p><b>Teacher Edition:</b> AE 81, 203, 207; FMC 31, 81, 197, 207; P 7; TNT 216</p>
<p>2. Demonstrate a sense of the relative magnitudes of numbers.</p>	<p><b>Student Edition:</b> 6-7, 80-83, 84-87, 196-200, 230-235</p> <p><b>Teacher Edition:</b> FMC 81</p>

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3. Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.	<b>Student Edition:</b> 282-286, 287-292, 298-303, 310-315, 320-326, 328-332, 344-348, 350-354 <i>Math Lab</i> 316, 342-343 <b>Teacher Edition:</b> AE 283, 299, 311, 321, 345; FMC 322, 329, 353; TNT 288
4. Compare and order numbers of all named types.	<b>Student Edition:</b> 215-220, 224, 235 #51-#54, 679, 707 #18 <i>Practice Test</i> 225 <b>Teacher Edition:</b> A 220; AA 218, 219, 220; AE 216, 217; T 215
5. Use whole numbers, fractions, decimals, and percents to represent equivalent forms of the same number.	<b>Student Edition:</b> 196-200, 202-205, 206-210, 223, 224, 328-332, 677, 678, 684, 707 <i>Mid-Chapter Quiz</i> 201 <i>Practice Test</i> 225 <b>Teacher Edition:</b> AE 197, 203, 207; FMC 197, 203, 207; PA 200; T 328; TNT 199
6. Understand that all fractions can be represented as repeating or terminating decimals.	<b>Student Edition:</b> 196-200, 205 #47-#49, 217, 223, 328-332, 336, 677, 684, 707 #8 <i>Mid-Chapter Quiz</i> 201 #19-#21 <i>Practice Test</i> 225 #6-#8 <b>Teacher Edition:</b> AE 197, 217, 329; ODI 196a, 328a; PA 200; T 328; TNT 168
<b>4.1.7 B. Numerical Operations</b>	
1. Use and explain procedures for performing calculations with integers and all number types named above with: <ul style="list-style-type: none"> <li>• Pencil-and-paper</li> <li>• Mental math</li> <li>• Calculator</li> </ul>	<b>Student Edition:</b> 4-5, 6-7, 25-29, 34, 38-41, 42-43, 230-235, 245 #26-#29, 248-249, 268 #33-#36 <i>Graphing Calculator Lab</i> 68-69 <i>Reading to Solve Problems</i> 24, 264 <i>Spreadsheet Lab</i> 327 <b>Teacher Edition:</b> AA 25, 38; AE 237; FMC 26; PA 257, 262; T 24

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2. Use exponentiation to find whole number powers of numbers.	<b>Student Edition:</b> 30-33, 37 #42-#46, 48 #2-#5, 71, LA2-LA5, 668, 704 #2, 720 #3, 724 #3 <i>Practice Test 75 #2-#3</i> <b>Teacher Edition:</b> AE 31; FMC 31, LA3; ODI 30a; PA 33; TNT LA4
3. Understand and apply the standard algebraic order of operations, including appropriate use of parentheses.	<b>Student Edition:</b> 38-41, 42-43, 44-47, 54-56, 72-73, 76-77, 156-161, LA6-LA9, 669, 670, 672 <i>Practice Test 75</i> <b>Teacher Edition:</b> A LA9; AA 55, 56; AE 39, 45, 53, 54, 157, LA8; FMC 54, 108; T 53, 107; TNT 53
<b>4.1.7 C. Estimation</b>	
1. Use equivalent representations of numbers such as fractions, decimals, and percents to facilitate estimation.	<b>Student Edition:</b> 4-5, 230-235, 343, 355-360, 366-367, 377 #6-#17, 385, 386, 390 #4, 636-639, 679, 685, 686, 701, 735 <i>Practice Test 389</i> <b>Teacher Edition:</b> AA 25, 46, 343, 360; FMC 356, 637; T 355; TNT 230, 358
<b>STANDARD 4.2 (GEOMETRY AND MEASUREMENT) ALL STUDENTS WILL DEVELOP SPATIAL SENSE AND THE ABILITY TO USE GEOMETRIC PROPERTIES, RELATIONSHIPS, AND MEASUREMENT TO MODEL, DESCRIBE AND ANALYZE PHENOMENA.</b>	
<b>Building upon knowledge and skills gained in preceding grades, by the end of <b>Grade 7</b>, students will:</b>	
<b>4.2.7 A. Geometric Properties</b>	
1. Understand and apply properties of polygons. <ul style="list-style-type: none"> <li>• Quadrilaterals, including squares, rectangles, parallelograms, trapezoids, rhombi</li> <li>• Regular polygons</li> </ul>	<b>Student Edition:</b> 524-529, 530, 533-538, 546-551, 564, 565, LA14-LA17, 694, 695 <i>Geometry Lab 532</i> <i>Practice Test 567</i> <b>Teacher Edition:</b> AA 537; AE 525, 534, 547; FMC 532, 534; PA 548; T 533; TNT 546

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<p>2. Understand and apply the concept of similarity.</p> <ul style="list-style-type: none"> <li>Using proportions to find missing measures</li> <li>Scale drawings</li> <li>Models of 3D objects</li> </ul>	<p><b>Student Edition:</b>  320-326, 336, 540-545, 551 #36, 557 #28, 565,  LA14-LA17, 684, 695, 724 #10, 732 #4  <i>Measurement Lab</i> 654-655  <i>Practice Test</i> 337  <i>Spreadsheet Lab</i> 327</p> <p><b>Teacher Edition:</b>  A 545; AE 321, 322, 542; FMC 322</p>
<p>3. Use logic and reasoning to make and support conjectures about geometric objects.</p>	<p><b>Student Edition:</b>  530-531, 583 #5, 601 #8  <i>Geometry Lab</i> 532  <i>Graphing Calculator Lab</i> 624-625  <i>Measurement Lab</i> 577, 654-655</p> <p><b>Teacher Edition:</b>  A 532; AA 530, 532, 624; AE 530; EC 577, 601,  655; F 654; T 577; TT 655</p>
<b>4.2.7 B. Transforming Shapes</b>	
<p>1. Understand and apply transformations.</p> <ul style="list-style-type: none"> <li>Finding the image, given the pre-image, and vice-versa</li> <li>Sequence of transformations needed to map one figure onto another</li> <li>Reflections, rotations, and translations result in images congruent to the pre-image</li> <li>Dilations (stretching/shrinking) result in images similar to the pre-image</li> </ul>	<p><b>Student Edition:</b>  553-557, 558-562, 566, 696, 713 #12-#13, 721 #9,  724 #11, 729 #13, 743-744  <i>Geometry Lab</i> 552  <i>Practice Test</i> 567 #15-#16</p> <p><b>Teacher Edition:</b>  AA 561; AE 554, 555, 559; FMC 554; PA 556;  T 552; TNT 554</p>
<b>4.2.7 C. Coordinate Geometry</b>	
<p>1. Use coordinates in four quadrants to represent geometric concepts.</p>	<p><b>Student Edition:</b>  88-92, 99 #47-#50, 121, 125 #13, 553-557,  558-562, 566, 672, 696, 713 #12-#13, 721 #9,  724 #11, 743-744</p> <p><b>Teacher Edition:</b>  AA 92, 561; AE 89, 555, 559; FMC 89; T 553</p>

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<p>2. Use a coordinate grid to model and quantify transformations (e.g., translate right 4 units).</p>	<p><b>Student Edition:</b> 553-557, 558-562, 566, 696, 713 #12-#13, 721 #9, 724 #11, 729 #13, 743-744 <i>Geometry Lab</i> 552 <i>Practice Test</i> 567 #15-#16</p> <p><b>Teacher Edition:</b> AA 561; AE 554, 555, 559; FMC 554; PA 556; T 552; TNT 554</p>
<b>4.2.7 D. Units of Measurement</b>	
<p>1. Solve problems requiring calculations that involve different units of measurement within a measurement system (e.g., 4'3" plus 7'10" equals 12'1").</p>	<p><b>Student Edition:</b> 12-13, 240 #48, 246 #38-#40, 246 #48, 248, 249 #7, 256 #38-#50, 268 #29-#37, 302 #29, 320-326, 709 #7-#14 <i>Real World Example</i> 267 <i>Spreadsheet Lab</i> 327</p> <p><b>Teacher Edition:</b> AA 246, 256; AE 322; ODI 236a; PA 325; TNT 322</p>
<p>2. Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.</p>	<p><b>Student Edition:</b> 572-576, 578-582, 584-588, 589-593, 594-595, 596-599, 613-618, 619-623, 656-659, 697, 698, 699 <i>Measurement Lab</i> 577, 583, 600-601</p> <p><b>Teacher Edition:</b> AE 594, 597, 620, 657; T 577, 578, 583</p>
<p>3. Recognize that all measurements of continuous quantities are approximations.</p>	<p><b>Student Edition:</b> 230-235, 584-588, 589-593, 596-599</p> <p><b>Teacher Edition:</b> AE 232, 590, 597; FMC 585, 590; T 230</p>
<b>4.2.7 E. Measuring Geometric Objects</b>	
<p>1. Develop and apply strategies for finding perimeter and area.</p> <ul style="list-style-type: none"> <li>• Geometric figures made by combining triangles, rectangles and circles or parts of circles</li> <li>• Estimation of area using grids of various sizes</li> </ul>	<p><b>Student Edition:</b> 156-162, 570, 572-576, 578-582, 584-588, 589-593, 594-595, 596-599 <i>Measurement Lab</i> 162, 577, 583</p> <p><b>Teacher Edition:</b> AA 595; AE 157, 573, 580, 594, 597; DI 158, 590; FMC 573; PA 576; T 162, 577</p>

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<p>2. Recognize that the volume of a pyramid or cone is one-third of the volume of the prism or cylinder with the same base and height (e.g., use rice to compare volumes of figures with same base and height).</p>	<p><b>Student Edition:</b> 613-618, 619-623, 630, 700, 701, 714 #11-#13 <i>Geometry Lab</i> 607 <i>Graphing Calculator Lab</i> 625 <i>Practice Test</i> 631 #16-#20</p> <p><b>Teacher Edition:</b> A 625; AE 614, 615; DI 603, 615, 620, 622; T 607, 619; TNT 615</p>
<p><b>STANDARD 4.3 (PATTERNS AND ALGEBRA) ALL STUDENTS WILL REPRESENT AND ANALYZE RELATIONSHIPS AMONG VARIABLE QUANTITIES AND SOLVE PROBLEMS INVOLVING PATTERNS, FUNCTIONS, AND ALGEBRAIC CONCEPTS AND PROCESSES.</b></p>	
<p>Building upon knowledge and skills gained in preceding grades, by the end of <b>Grade 7</b>, students will:</p>	
<p><b>4.3.7 A. Patterns</b></p>	
<p>1. Recognize, describe, extend, and create patterns involving whole numbers, rational numbers, and integers.</p> <ul style="list-style-type: none"> <li>• Descriptions using tables, verbal and symbolic rules, graphs, simple equations or expressions</li> <li>• Finite and infinite sequences</li> <li>• Generating sequences by using calculators to repeatedly apply a formula</li> </ul>	<p><b>Student Edition:</b> 57-61, 63-67, 74, 163-167, 172, 293-297, 676, 682, 706 #12-#16, 720 #7, 728 #8, 730-731 <i>Algebra Lab</i> 62 <i>Graphing Calculator Lab</i> 68-69, 168 <i>Measurement Lab</i> 162</p> <p><b>Teacher Edition:</b> A 162; AE 58, 59, 63, 64, 164; EC 62; PA 61</p>
<p><b>4.3.7 B. Functions and Relationships</b></p>	
<p>1. Graph functions, and understand and describe their general behavior.</p> <ul style="list-style-type: none"> <li>• Equations involving two variables</li> </ul>	<p><b>Student Edition:</b> 63-67, 74, 163-167, 172, 676, 706 #12-#16 <i>Graphing Calculator Lab</i> 68-69, 168 <i>Measurement Lab</i> 162 <i>Practice Test</i> 75 #24-#25, 173 #21-#25</p> <p><b>Teacher Edition:</b> A 69; AA 66; AE 64, 164, 165; FMC 64, 164; TNT 166</p>

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<b>4.3.7 C. Modeling</b>	
<p>1. Analyze functional relationships to explain how a change in one quantity can result in a change in another, using pictures, graphs, charts, and equations.</p>	<p><b>Student Edition:</b> 63-67, 74, 163-167, 172, 174 #1, 671, 676, 704 #12, 706 #13-#16, 730-731 <i>Graphing Calculator Lab</i> 68-69, 168 <i>Measurement Lab</i> 162 <i>Practice Test</i> 75</p> <p><b>Teacher Edition:</b> AA 65; AE 64, 164, 165; TNT 166</p>
<p>2. Use patterns, relations, symbolic algebra, and linear functions to model situations.</p> <ul style="list-style-type: none"> <li>• Using manipulatives, tables, graphs, verbal rules, algebraic expressions/ equations/ inequalities</li> <li>• Growth situations, such as population growth and compound interest, using recursive (e.g., NOW-NEXT) formulas (cf. science standard 5.5 and social studies standard 6.6)</li> </ul>	<p><b>Student Edition:</b> 57-61, 63-67, 74, 112-113, 172, 174 #1, 382 #23, 676, 704 #11 <i>Algebra Lab</i> 62 <i>Graphing Calculator Lab</i> 68-69, 168 <i>Measurement Lab</i> 162 <i>Practice Test</i> 75</p> <p><b>Teacher Edition:</b> AA 65; AE 58, 59, 112, 164, 165; PA 61; TNT 382</p>
<b>4.3.7 D. Procedures</b>	
<p>1. Use graphing techniques on a number line.</p> <ul style="list-style-type: none"> <li>• Absolute value</li> <li>• Arithmetic operations represented by vectors (arrows) (e.g., “-3 + 6” is “left 3, right 6”)</li> </ul>	<p><b>Student Edition:</b> 80-83, 84-87, 95-99, 103-106, 107-111, 120, 121, 671 <i>Algebra Lab</i> 93-94, 101-102</p> <p><b>Teacher Edition:</b> AA 82; AE 81, 97; DI 98, 109; T 95, 101; TNT 104</p>
<p>2. Solve simple linear equations informally and graphically.</p> <ul style="list-style-type: none"> <li>• Multi-step, integer coefficients only (although answers may not be integers)</li> <li>• Using paper-and-pencil, calculators, graphing calculators, spreadsheets, and other technology</li> </ul>	<p><b>Student Edition:</b> 148-149, 151-153, 156-161, 163-167, 171, LA6-LA9, 675 <i>Graphing Calculator Lab</i> 168 <i>Measurement Lab</i> 162 <i>Reading to Solve Problems</i> 150</p> <p><b>Teacher Edition:</b> AE 152, LA7; DI 158; FMC 152, 157, 164, LA7; ODI 148a; TNT 151, 152</p>

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<p>3. Create, evaluate, and simplify algebraic expressions involving variables.</p> <ul style="list-style-type: none"> <li>Order of operations, including appropriate use of parentheses</li> <li>Substitution of a number for a variable</li> </ul>	<p><b>Student Edition:</b> 44-47, 52 #36, 55 #29-#36, 73, 128-133, 170, 669, 674 <i>Mid-Chapter Quiz</i> 48 <i>Practice Test</i> 75 #9-#12, 173 #1-#2 <i>Real World Example</i> 59</p> <p><b>Teacher Edition:</b> AE 45, 59, 128, 129; FMC 45; TNT 131</p>
<p>4. Understand and apply the properties of operations, numbers, equations, and inequalities.</p> <ul style="list-style-type: none"> <li>Additive inverse</li> <li>Multiplicative inverse</li> </ul>	<p><b>Student Edition:</b> 38-41, 42-43, 44-47, 49-52, 53-56, 95-99, 136-141, 142-146, 151-155, 258-263, 740-741 <i>Algebra Lab</i> 134-135</p> <p><b>Teacher Edition:</b> AE 39, 53, 152, 259; FMC 45, 54, 96; PA 262; TNT 40</p>
<p><b>STANDARD 4.4 (DATA ANALYSIS, PROBABILITY, AND DISCRETE MATHEMATICS) ALL STUDENTS WILL DEVELOP AN UNDERSTANDING OF THE CONCEPTS AND TECHNIQUES OF DATA ANALYSIS, PROBABILITY, AND DISCRETE MATHEMATICS, AND WILL USE THEM TO MODEL SITUATIONS, SOLVE PROBLEMS, AND ANALYZE AND DRAW APPROPRIATE INFERENCES FROM DATA.</b></p>	
<p>Building upon knowledge and skills gained in preceding grades, by the end of <b>Grade 7</b>, students will:</p>	
<p><b>4.4.7 A. Data Analysis</b></p>	
<p>1. Select and use appropriate representations for sets of data, and measures of central tendency (mean, median, and mode).</p> <ul style="list-style-type: none"> <li>Type of display most appropriate for given data</li> <li>Box-and-whisker plot, upper quartile, lower quartile</li> <li>Scatter plot</li> <li>Calculators and computer used to record and process information</li> </ul>	<p><b>Student Edition:</b> 396-401, 402-408, 410-414, 415-421, 451, 452, LA21-LA25 <i>Graphing Calculator Lab</i> 409 <i>Practice Test</i> 455 <i>Spreadsheet Lab</i> 432-433</p> <p><b>Teacher Edition:</b> A 409; AE 404, LA22; FMC 397, 403, 404; TNT 416</p>
<p>2. Make inferences and formulate and evaluate arguments based on displays and analysis of data.</p>	<p><b>Student Edition:</b> 424, 426-431, 434-437, 438-443, 453, 454, 689, 690, 711, 750 <i>Practice Test</i> 455 <i>Spreadsheet Lab</i> 422</p> <p><b>Teacher Edition:</b> AA 422; AE 427, 428, 435, 439, 440; PA 425; T 422</p>

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<b>4.4.7 B. Probability</b>	
1. Interpret probabilities as ratios, percents, and decimals.	<b>Student Edition:</b> 460-464, 465-470, 471-474, 480-483, 484, 486-490, 499, 690, 712, 723 #2 <i>Mid-Chapter Quiz</i> 479 <i>Practice Test</i> 503 <i>Probability Lab</i> 491 <b>Teacher Edition:</b> A 464; AE 461, 467, 481, 484, 488; FMC 487
2. Model situations involving probability with simulations (using spinners, dice, calculators and computers) and theoretical models. <ul style="list-style-type: none"> <li>Frequency, relative frequency</li> </ul>	<b>Student Edition:</b> 460-464, 465-470, 484-485, 486-490, 492-497, 499, 502, 692 <i>Practice Test</i> 503 <i>Probability Lab</i> 491 <b>Teacher Edition:</b> AE 488; F 484; FMC 487; PA 490; T 460, 484, 486
3. Estimate probabilities and make predictions based on experimental and theoretical probabilities.	<b>Student Edition:</b> 463 #29, 473 #16, 486-490, 496 #31-#32 <i>Probability Lab</i> 491 <b>Teacher Edition:</b> A 490; AA 463, 473; AE 488; DI 491; FMC 487; ODI 460a, 486a
4. Play and analyze probability-based games, and discuss the concepts of fairness and expected value.	<b>Student Edition:</b> 460-464, 465-470, 486-490, 493-497, 499, 502 <i>Mid-Chapter Quiz</i> 479 <i>Probability Lab</i> 491 <b>Teacher Edition:</b> AA 489; AE 461, 462, 467; DI 491; ODI 460a; TNT 461, 467
<b>4.4.7 C. Discrete Mathematics—Systematic Listing and Counting</b>	
1. Apply the multiplication principle of counting. <ul style="list-style-type: none"> <li>Permutations: ordered situations with replacement (e.g., number of possible license plates) vs. ordered situations without replacement (e.g., number of possible slates of 3 class officers from a 23 student class)</li> </ul>	<b>Student Edition:</b> 475-478, 480-483, 484-485, 486-490, 500, 501, 691, 712, 729 #22, 733 #9 <i>Practice Test</i> 503 <i>Probability Lab</i> 491 <b>Teacher Edition:</b> AE 476, 480; FMC 476; T 475

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<p>2. Explore counting problems involving Venn diagrams with three attributes (e.g., there are 15, 20, and 25 students respectively in the chess club, the debating team, and the engineering society; how many different students belong to the three clubs if there are 6 students in chess and debating, 7 students in chess and engineering, 8 students in debating and engineering, and 2 students in all three?).</p>	<p><b>Student Edition:</b> 186-189, 190-191, 465-470, 471-474, 475-478, 480-483, 484-485, 492-497, 677, 707 #6 <i>Geometry Lab</i> 532</p> <p><b>Teacher Edition:</b> AA 187, 484; AE 190; DI 481; FMC 187; ODI 465a, 475a</p>
<p>3. Apply techniques of systematic listing, counting, and reasoning in a variety of different contexts.</p>	<p><b>Student Edition:</b> 180-184, 190-191, 465-470, 480, 484-485, 499, 501, 677, 707 #6 <i>Mini Lab</i> 475, 486</p> <p><b>Teacher Edition:</b> AA 468, 475; AE 190, 467; DI 191; FMC 182, 466; ODI 465a</p>
<p><b>4.4.7 D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms</b></p>	
<p>1. Use vertex-edge graphs to represent and find solutions to practical problems.</p> <ul style="list-style-type: none"> <li>• Finding the shortest network connecting specified sites</li> <li>• Finding the shortest route on a map from one site to another</li> <li>• Finding the shortest circuit on a map that makes a tour of specified sites</li> </ul>	<p><b>Student Edition:</b> 320-326, 336, 473 #11, 677, 684, 709 #13</p> <p><b>Teacher Edition:</b> AE 321; FMC 322</p>
<p><b>STANDARD 4.5 (MATHEMATICAL PROCESSES) ALL STUDENTS WILL USE MATHEMATICAL PROCESSES OF PROBLEM SOLVING, COMMUNICATION, CONNECTIONS, REASONING, REPRESENTATIONS, AND TECHNOLOGY TO SOLVE PROBLEMS AND COMMUNICATE MATHEMATICAL IDEAS.</b></p>	
<p>At each grade level, with respect to content appropriate for that grade level, students will:</p>	
<p><b>4.5 A. Problem Solving</b></p>	
<p>1. Learn mathematics through problem solving, inquiry, and discovery.</p>	<p><b>Student Edition:</b> 4-5, 25-29, 112-113, 148-149, 248-249 <i>Algebra Lab</i> 62 <i>Geometry Lab</i> 607 <i>Graphing Calculator Lab</i> 624-625 <i>Measurement Lab</i> 162, 600-601, 654-655</p> <p><b>Teacher Edition:</b> AE 26; F 654; T 4, 25; TNT 199</p>

STANDARDS	PAGE REFERENCES
<p>2. Solve problems that arise in mathematics and in other contexts.</p> <ul style="list-style-type: none"> <li>• Open-ended problems</li> <li>• Non-routine problems</li> <li>• Problems with multiple solutions</li> <li>• Problems that can be solved in several ways</li> </ul>	<p><b>Student Edition:</b>  25-29, 56 #39, 61 #34, 92 #47, 132 #37-#40  <i>Math Lab</i> 316  <i>Problem-Solving Investigation</i> 42-43, 112-113, 148-149, 190-191, 248-249, 318-319, 366-367, 424-425, 484-485, 594-595, 646-647  <i>Reading to Solve Problems</i> 24</p> <p><b>Teacher Edition:</b>  A 29; DI 28; FMC 26; SQ 25; TNT 25, 199, 597</p>
<p>3. Select and apply a variety of appropriate problem-solving strategies (e.g., “try a simpler problem” or “make a diagram”) to solve problems.</p>	<p><b>Student Edition:</b>  4-5, 25-29, 42-43, 112-113, 148-149, 318-319, 424-425, 530-531, 594-595  <i>Reading to Solve Problems</i> 24</p> <p><b>Teacher Edition:</b>  AE 318, 424; F 4, 42, 530, 594; FMC 26; P 149; T 4, 25</p>
<p>4. Pose problems of various types and levels of difficulty.</p>	<p><b>Student Edition:</b>  596-599  <i>Measurement Lab</i> 600-601  <i>Problem-Solving Investigation</i> 42-43, 112-113, 148-149, 190-191, 248-249, 318-319, 366-367, 424-425, 484-485, 594-595, 646-647</p> <p><b>Teacher Edition:</b>  F 594; SQ 112, 594; TNT 595, 597, 601</p>
<p>5. Monitor their progress and reflect on the process of their problem solving activity.</p>	<p><b>Student Edition:</b>  136-141  <i>Algebra Lab</i> 134-135  <i>Problem-Solving Investigation</i> 42 #1-#2, 190 #1-#2</p> <p><b>Teacher Edition:</b>  A 43, 135, 141; DI 139, 191; F 136; SQ 136; T 134-135; TNT 199</p>
<p>6. Distinguish relevant from irrelevant information, and identify missing information.</p>	<p><b>Student Edition:</b>  25-29  <i>Mid-Chapter Quiz</i> 48 #1  <i>Practice Test</i> 75 #1  <i>Study Guide and Review</i> 71  <i>Test Practice</i> 29, 76 #1, 77 #6-#8</p> <p><b>Teacher Edition:</b>  AE 26-27</p>

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<b>4.5 B. Communication</b>	
1. Use communication to organize and clarify their mathematical thinking. <ul style="list-style-type: none"> <li>• Reading and writing</li> <li>• Discussion, listening, and questioning</li> </ul>	<b>Student Edition:</b> 25-29, 111 #49-#53, 133 #40, 235 #48, 240 #48, 248-249, 484-485, 646 #2 <i>Graphing Calculator Lab</i> 68-69 <b>Teacher Edition:</b> AA 111, 407, 484, 485; DI 366, 590, 615
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	<b>Student Edition:</b> 42, 112, 190, 246 #39, 248, 366, 424 #1, 484, 530, 594 #3 <b>Teacher Edition:</b> A 382; DI 191, 366, 522, 531, 541, 615, 620, 659; IL 136a; R 646a; RWUP 21
3. Analyze and evaluate the mathematical thinking and strategies of others.	<b>Student Edition:</b> 42, 112, 190, 246 #39, 248, 366, 484 <i>Graphing Calculator Lab</i> 409 <b>Teacher Edition:</b> A 382; DI 191, 366, 522, 531, 541, 615, 620, 659; IL 136a; R 646a; RWUP 21
4. Use the language of mathematics to express mathematical ideas precisely.	<b>Student Edition:</b> 47 #39-#43, 53-56, 65 #9-#12, 128-133, 320-326, 369-374, 375-378, 402-408, 492-497 <i>Real World Example</i> 50 <i>Spreadsheet Lab</i> 383 <b>Teacher Edition:</b> A 47; AA 55; AE 129, 403; FMC 50, 403
<b>4.5 C. Connections</b>	
1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	<b>Student Edition:</b> 57-61, 63-67 <i>Algebra Lab</i> 62 <i>Graphing Calculator Lab</i> 68-69, 168, 624 <i>Measurement Lab</i> 162 <i>Problem-Solving Investigation</i> 112-113 <b>Teacher Edition:</b> A 61; AE 58, 64; FMC 58, 64; SQ 57, 63, 112

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<p>2. Use connections among mathematical ideas to explain concepts (e.g., two linear equations have a unique solution because the lines they represent intersect at a single point).</p>	<p><b>Student Edition:</b>            293-297, 320-325, 328-332, 379-382, 584-588, 594-595  <i>Measurement Lab</i> 583  <i>Mini Lab</i> 589, 636, 649</p> <p><b>Teacher Edition:</b>            A 315, 327; AE 594, 637; FMC 311; ODI 163a, 589a; T 310</p>
<p>3. Recognize that mathematics is used in a variety of contexts outside of mathematics.</p>	<p><b>Student Edition:</b>            4-5, 10-11, 14-15, 46 #31, 64  <i>Real-World Example</i> 104, 113 #6, #13, 137, 298-303, 304-309, 320-326  <i>Vocabulary Link</i> 397, 407 #20-#22, 692  <i>Spreadsheet Lab</i> 327</p> <p><b>Teacher Edition:</b>            A 15; AA 325; AE 321; EC 327; T 10</p>
<p>4. Apply mathematics in practical situations and in other disciplines.</p>	<p><b>Student Edition:</b>  <i>Real-World Example</i> 65 #3, 67 #27, 139 #21, 190-191, 235 #47, 283, 318-319, 331 #40, 366-367, 375-378, 379-382, 480-483  <i>Geometry Lab</i> 607 #4  <i>Spreadsheet Lab</i> 383</p> <p><b>Teacher Edition:</b>            A 83; AA 67, 190, 308; AE 190, 305, 366, 380, 480; DI 87; T 318; TNT 381</p>
<p>5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).</p>	<p><b>Student Edition:</b>  <i>Problem Solving in Art</i> 279  <i>Problem Solving in Geography</i> 177, 270  <i>Problem Solving in Social Studies</i> 167  <i>Real-World Example</i> 207, 208</p> <p><b>Teacher Edition:</b>            MCC 21, 279, 507; RUP 21</p>
<p>6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p>	<p><b>Student Edition:</b>            293-297, 320-325, 328-332, 379-382, 594-595  <i>Graphing Calculator Lab</i> 68-69  <i>Measurement Lab</i> 583  <i>Mini Lab</i> 589, 637, 649</p> <p><b>Teacher Edition:</b>            A 67, 315, 327, 595; AE 594; FMC 311; ODI 163a, 589a; T 310, 640</p>

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<b>4.5 D. Reasoning</b>	
1. Recognize that mathematical facts, procedures, and claims must be justified.	<b>Student Edition:</b> 111 #51-#52, 155 #34, 214 #32, 433 #2, 438-443, 444-449, 454, 530-531, 690, 711 <i>Real World Example</i> 548 <b>Teacher Edition:</b> AA 443; AE 439, 445, 446; F 530; TNT 448
2. Use reasoning to support their mathematical conclusions and problem solutions.	<b>Student Edition:</b> 25-29, 112-113, 248-249, 325 #31, 366-367, 434-437, 438-443, 530-531, 594-595, 646-647 <i>Graphing Calculator Lab</i> 68-69, 409, 624-625 <i>Spreadsheet Lab</i> 422 <b>Teacher Edition:</b> A 625; AE 112, 439; F 530; P 595
3. Select and use various types of reasoning and methods of proof.	<b>Student Edition:</b> 42-43, 148-149, 248-249, 366-367, 525-529, 530-531, 537 #35, 538 #49, 539 #10, 565, 694 <b>Teacher Edition:</b> A 249, 529; AA 148, 537; AE 42, 248, 366, 526; DI 531; T 42
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.	<b>Student Edition:</b> 25-29, 42-43, 48 #14, 148-149, 248-249, 366-367, 530-531, 594-595, 669 <i>Graphing Calculator Lab</i> 409 <b>Teacher Edition:</b> F 42; FMC 26; PA 54; T 42; TNT 248
5. Make and investigate mathematical conjectures. <ul style="list-style-type: none"> <li>• Counterexamples as a means of disproving conjectures</li> <li>• Verifying conjectures using informal reasoning or proofs.</li> </ul>	<b>Student Edition:</b> 56 #41, 111 #51, 214 #32, 438-443, 444-449, 454, 530-531, 690, 711 <i>Graphing Calculator Lab</i> 409 <i>Real World Example</i> 548 <b>Teacher Edition:</b> AA 56, 443; AE 439, 445, 446; F 530
6. Evaluate examples of mathematical reasoning and determine whether they are valid.	<b>Student Edition:</b> 111 #52, 155 #34, 214 #32, 235 #47-#48, 366-367, 438-443, 444-449, 454, 690, 711 <b>Teacher Edition:</b> AA 235, 443; AE 439, 445, 446; DI 366; ODI 426a; PA 54; TNT 428, 444, 448

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<b>4.5 E. Representations</b>	
<p>1. Create and use representations to organize, record, and communicate mathematical ideas.</p> <ul style="list-style-type: none"> <li>Concrete representations (e.g., base-ten blocks or algebra tiles)</li> <li>Pictorial representations (e.g., diagrams, charts, or tables)</li> <li>Symbolic representations (e.g., a formula)</li> <li>Graphical representations (e.g., a line graph)</li> </ul>	<p><b>Student Edition:</b> 396-401, 424-425, 426-431, 578-582, 584-588, 613-618 <i>Algebra Lab</i> 93-94, 101-102, 134-135 <i>Math Lab</i> 250-251 <i>Spreadsheet Lab</i> 422, 432-433</p> <p><b>Teacher Edition:</b> AA 93, 134; DI 250; T 101, 422</p>
<p>2. Select, apply, and translate among mathematical representations to solve problems.</p>	<p><b>Student Edition:</b> 57-61, 107-111, 114-118, 142-146, 151-155, 211-214, 265-270, 369-374, 646-647 <i>Geometry Lab</i> 607</p> <p><b>Teacher Edition:</b> A 62, 94, 102, 135, 251; T 57, 94</p>
<p>3. Use representations to model and interpret physical, social, and mathematical phenomena.</p>	<p><b>Student Edition:</b> 415-421, 424-425, 426-431, 575 #20-#21, 581 #11, 581 #18, 587 #34, 617 #19-#20 <i>Math Lab</i> 250-251 <i>Real World Example</i> 580 <i>Spreadsheet Lab</i> 383, 422, 432-433</p> <p><b>Teacher Edition:</b> AE 416, 417, 445, 446; PA 425</p>
<b>4.5 F. Technology</b>	
<p>1. Use technology to gather, analyze, and communicate mathematical information.</p>	<p><b>Student Edition:</b> <i>Graphing Calculator Lab</i> 68-69, 168, 409, 624-625 <i>Math Online</i> 84, 103, 177, 320, 369 <i>Spreadsheet Lab</i> 327, 383, 422, 432-433</p> <p><b>Teacher Edition:</b> A 69, 383; DI 522; F 327; RUP 177; T 168; TNT 168</p>
<p>2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.</p>	<p><b>Student Edition:</b> <i>Graphing Calculator Lab</i> 68-69, 168, 409, 624-625 <i>Spreadsheet Lab</i> 327, 383, 422, 432-433</p> <p><b>Teacher Edition:</b> A 69, 383, 422, 433; F 327; T 168, 409; TNT 168, 422</p>

STANDARDS	PAGE REFERENCES
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.	<b>Student Edition:</b> <i>Graphing Calculator Lab</i> 68-69, 168, 624-625 <b>Teacher Edition:</b> A 69, 168, 69, 625; AA 624; ALR 163b; F 624; GCEF 22c; IC 126c; T 68, 168, 624; TNT 168
4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).	<b>Student Edition:</b> 35, 589, 637 <i>Graphing Calculator Lab</i> 68-69, 168, 409, 624-625 <i>Study Tip</i> 585 <b>Teacher Edition:</b> A 69, 409, 625; T 68, 168, 409, 624; TNT 168, 199
5. Use computer software to make and verify conjectures about geometric objects.	<b>Student Edition:</b> <i>Graphing Calculator Lab</i> 624-625 <b>Teacher Edition:</b> A 625; ALR 510b, 514b, 518b, 533b, 546b; IC 508c; NI 508E; RUP 507; T 624
6. Use computer-based laboratory technology for mathematical applications in the sciences (cf. science standards).	<b>Student Edition:</b> <i>Problem Solving in Science</i> 393, 497 <i>Spreadsheet Lab</i> 432-433 <b>Teacher Edition:</b> MG 393; TT 393