



# Math Connects

Concepts, Skills, and Problem Solving

Course 1

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STANDARDS	PAGE REFERENCES
<p><b>Mathematics Performance Standard A</b></p>	
<p>Mathematics, Standard A: Mathematical Processes Performance Standards - Grade 8 By the end of <b>grade eight</b>, students will:</p>	
<p>A.8.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> <li>• evaluate information</li> <li>• perceive patterns</li> <li>• identify relationships</li> <li>• formulate questions for further exploration</li> <li>• evaluate strategies</li> <li>• justify statements</li> <li>• test reasonableness of results</li> <li>• defend work</li> </ul>	<p><b>Student Edition:</b> 24-27, 31 #45, #47, 35 #41, 45 #48, 114-118, 343-348, 392 #23, 394-398 <i>Extend</i> 61-62, 119-120 <i>Problem-Solving Investigation</i> 184-185, 341-342 <b>Teacher Edition:</b> A 27, 118, 185; F 184, 341; PAA 116, 395; SQ 114</p>
<p>A.8.2 Communicate logical arguments clearly to show why a result makes sense</p>	<p><b>Student Edition:</b> 24-27, 45 #48, 59 #33, 88-91, 144 #31, 394-398 <i>Problem-Solving Investigation</i> 54-55, 341-342 <i>Extend</i> 61-62 <b>Teacher Edition:</b> A 27; FMC 89; PAA 395; SQ 88, 394</p>

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<p>A.8.3 Analyze non-routine* problems by modeling*, illustrating, guessing, simplifying, generalizing, shifting to another point of view, etc.</p>	<p><b>Student Edition:</b>  <i>Problem-Solving Investigation</i> 54-55, 214-215, 254-255, 399-400, 546-547  <i>Mini Lab</i> 57, 548  <i>Explore</i> 261-262, 554</p> <p><b>Teacher Edition:</b>  A 55, 255, 400, 547; DI 215, 255; SQ 54, 214, 254, 399, 546; TNT 546</p>
<p>A.8.4 Develop effective oral and written presentations that include</p> <ul style="list-style-type: none"> <li>• appropriate use of technology</li> <li>• the conventions of mathematical discourse (e.g., symbols, definitions, labeled drawings)</li> <li>• mathematical language</li> <li>• clear organization of ideas and procedures</li> <li>• understanding of purpose and audience</li> </ul>	<p><b>Student Edition:</b>  114-118  <i>Graphing Calculator Lab</i> 47-48  <i>Explore</i> 86-87  <i>Spreadsheet Lab</i> 107  <i>Statistics Lab</i> 119-120</p> <p><b>Teacher Edition:</b>  A 27, 118, 120; PAA 40, 116; SQ 114; T 47; TNT 87</p>
<p>A.8.5 Explain mathematical concepts, procedures, and ideas to others who may not be familiar with them</p>	<p><b>Student Edition:</b>  91 #22, 154 #36, 182 #43, 319 #31, 404 #30  <i>Reading to Solve Problems</i> 376</p> <p><b>Teacher Edition:</b>  A 91, 141, 154, 183, 268, 369</p>
<p>A.8.6 Read and understand mathematical texts and other instructional materials and recognize mathematical ideas as they appear in other contexts</p>	<p><b>Student Edition:</b>  166 #49-#50, 455-458, 556 EX 2  <i>Problem-Solving Investigation</i> 78-79, 184-185, 593 #14  <i>Statistics Lab</i> 119-120  <i>Measurement Lab</i> 459-460</p> <p><b>Teacher Edition:</b>  A 141</p>

STANDARDS	PAGE REFERENCES
<b>Mathematics Performance Standard B</b>	
Mathematics, Standard B: Number Operations and Relationships Performance Standards - Grade 8 By the end of <b>grade eight</b> , students will:	
B.8.1 Read, represent, and interpret various rational numbers* (whole numbers*, integers*, decimals, fractions, and percents) with verbal descriptions, geometric models*, and mathematical notation (e.g., expanded*, scientific*, exponential*)	<b>Student Edition:</b> 121-125, 138-141, 145 #39-#43, 204-208, 209-212, 365-369 <i>Explore</i> 202 <b>Teacher Edition:</b> AE 139, 366; DI 123, 138, 366; FMC 122; SQ 204, 365; TNT 139, 365
B.8.2 Perform and explain operations on rational* numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value)	<b>Student Edition:</b> 32-36, 121-125, 156-160, 163-166, 169-172, 173-176, 179-183, 225-228, 229-232, 256-260, 263-268, 270-274, 282-286, 287-290, 293-297, 298-301 <i>Explore</i> 155, 162, 167-168, 177-178, 261-262, 291-292 <i>Mid-Chapter Quiz</i> 275 <b>Teacher Edition:</b> A 160, 176, 260; AE 33-34, 121-122, 257-258, 264-265; FMC 122, 264; SQ 32, 121, 156, 173, 256
B.8.3 Generate and explain equivalencies among fractions, decimals, and percents	<b>Student Edition:</b> 204-208, 212 #36-#38, 225-228, 229-232, 268 #59-#62 <i>Math Lab</i> 202-203 <i>Mid-Chapter Quiz</i> 213 #6-#12 <i>Study Guide and Review</i> 239, 241-242 <b>Teacher Edition:</b> AE 205-206, 226; DI 207; FMC 205; SC 204
B.8.4 Express order relationships among rational numbers using appropriate symbols (>, <, ≥, ≤, ≠)	<b>Student Edition:</b> 142-145, 149 #36-#39, 154 #40, 166 #52-#54, 220-224, 375 #25, 379 #35-#37, #39 <i>Mid-Chapter Quiz</i> 161 #1-#14 <i>Study Guide and Review</i> 187, 241 <i>Practice Test</i> 191 #1-#8 <b>Teacher Edition:</b> 142b, 220b A 145; AE 143, 221; DI 144; SC 142

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<p>B.8.5 Apply proportional thinking in a variety of problem situations that include, but are not limited to</p> <ul style="list-style-type: none"> <li>ratios and proportions (e.g., rates, scale drawings*, similarity*)</li> <li>percents, including those greater than 100 and less than one (e.g., discounts, rate of increase or decrease, sales tax)</li> </ul>	<p><b>Student Edition:</b>  314-319, 322-327, 329-333, 334-339, 348 #32-#35, 349-353  <i>Graphing Calculator Lab</i> 328, 354  <i>Mid-Chapter Quiz</i> 340  <i>Study Guide and Review</i> 356-358  <i>Practice Test</i> 359</p> <p><b>Teacher Edition:</b>  314b, 322b, 329b, 334b, 349b  A 319; AE 315, 323-324; FMC 323; PAA 316; SC 322</p>
<p>B.8.6 Model* and solve problems involving number-theory concepts such as</p> <ul style="list-style-type: none"> <li>prime* and composite numbers</li> <li>divisibility and remainders</li> <li>greatest common factors</li> <li>least common multiples</li> </ul>	<p><b>Student Edition:</b>  28-31, 34 Ex. 4-6, #7-#9, 35 #26-#33, 36 #48-#52, 40 #36-#39, 195 #8-#10, 198 Ex. 3, 217 Ex. 2-3, #23, 333 #31-#34  <i>Mid-Chapter Quiz</i> 41 #3-#6  <i>Study Guide and Review</i> 69 #8-#13, 239 Ex. 1, 240 Ex. 7  <i>Practice Test</i> 73 #2-#5  <i>Test Practice</i> 74 #5, 361 #10</p> <p><b>Teacher Edition:</b>  A 31; AE 29; FMC 29; SC 28</p>
<p>B.8.7 In problem-solving situations, select and use appropriate computational procedures with rational numbers such as</p> <ul style="list-style-type: none"> <li>calculating mentally</li> <li>estimating</li> <li>creating, using, and explaining algorithms*</li> <li>using technology (e.g., scientific calculators, spreadsheets)</li> </ul>	<p><b>Student Edition:</b>  24-27, 121-125, 150-154, 164 EX 5, 165 #25-#32, 173-176, 249-253, 263-268, 276-279  <i>Problem-Solving Investigation</i> 78-79  <i>Spreadsheet Lab</i> 86-87</p> <p><b>Teacher Edition:</b>  A 27, 176; AE 25-26, 151-152, 277; FMC 277; SQ 150, 276</p>

STANDARDS	PAGE REFERENCES
<b>Mathematics Performance Standard C</b>	
Mathematics, Standard C: Geometry Performance Standards - Grade 8 By the end of <b>grade eight</b> , students will:	
C.8.1 Describe special and complex two- and three-dimensional figures (e.g., rhombus, polyhedron, cylinder) and their component parts (e.g., base, altitude, and slant height) by: <ul style="list-style-type: none"> <li>• naming, defining, and giving examples</li> <li>• comparing, sorting, and classifying them</li> <li>• identifying and contrasting their properties (e.g., symmetrical*, isosceles, regular)</li> <li>• drawing and constructing physical models to specifications</li> <li>• explaining how these figures are related to objects in the environment</li> </ul>	<b>Student Edition:</b> 488-491, 494-499, 502-507 <i>Geometry Lab</i> 485, 493, 508 <i>Mid-Chapter Quiz</i> 492 #13-#15 <i>Study Guide and Review</i> 512-514 <i>Practice Test</i> 515 #8-#16 <b>Teacher Edition:</b> A 499; AE 487-488; FMC 495; SC 486; TNT 495
C.8.2 Identify and use relationships among the component parts of special and complex two- and three-dimensional figures (e.g., parallel sides, congruent* faces).	<b>Student Edition:</b> 488-491, 494-499, 502-507 <i>Geometry Lab</i> 485, 493, 508 <i>Mid-Chapter Quiz</i> 492 #13-#15 <i>Study Guide and Review</i> 512-514 <i>Practice Test</i> 515 #8-#16 <b>Teacher Edition:</b> A 499; AE 487-488; FMC 495; SC 486; TNT 495
C.8.3 Identify three-dimensional shapes from two-dimensional perspectives and draw two-dimensional sketches of three-dimensional objects preserving their significant features	<b>Student Edition:</b> 555-559 <i>Problem-Solving Investigation</i> 546-547 <i>Geometry Lab</i> 554 <b>Teacher Edition:</b> A 559; PAA 559; SC 555; T 555
C.8.4 Perform transformations* on two-dimensional figures and describe and analyze the effects of the transformations on the figures	<b>Student Edition:</b> 604-609, 610-614, 615-619 <i>Study Guide and Review</i> 623-624 <i>Practice Test</i> 625 #28-#33 <i>Test Practice</i> 627 #12 <b>Teacher Edition:</b> A 609, 611, 619; AE 605-606, 611, 616; FMC 605, 611, 616; SQ 604, 610, 615; TNT 607, 618

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C.8.5 Locate objects using the rectangular coordinate system*	<p><b>Student Edition:</b>            233-237, 599-603, 609 #38-#41, 614 #31-#34  <i>Test Practice</i> 73 #9-#20  <i>Study Guide and Review</i> 242, 623  <i>Practice Test</i> 243 #21-#25, 625 #20-#25</p> <p><b>Teacher Edition:</b>            233b, 599b            A 237; AE 234-235, 600; FMC 600; PAA 603;            SQ 599</p>
<b>Mathematics Performance Standard D</b>	
<p>Mathematics, Standard D: Measurement Performance Standards - Grade 8</p> <p>By the end of <b>grade eight</b>, students will:</p>	
D.8.1 Identify and describe attributes* in situations where they are not directly* or easily measurable (e.g., distance, area of an irregular figure, likelihood of occurrence)	<p><b>Student Edition:</b>            381-386,  <i>Extend</i> 387  <i>Problem-Solving Investigation</i> 442-443  <i>Measurement Lab</i> 459-460</p> <p><b>Teacher Edition:</b>            FMC 382</p>
<p>D.8.2 Demonstrate understanding of basic measurement facts, principles, and techniques including the following</p> <ul style="list-style-type: none"> <li>• approximate comparisons between metric and US Customary units (e.g., a liter and a quart are about the same; a kilometer is about six-tenths of a mile)</li> <li>• knowledge that direct measurement* produces approximate, not exact, measures</li> <li>• the use of smaller units to produce more precise measures</li> </ul>	<p><b>Student Edition:</b>            418-423, 424-429, 436 #42-#45, 445-449, 454 #34-#36, 455-458  <i>Measurement Lab</i> 430-431  <i>Mid-Chapter Quiz</i> 444 #1-#12  <i>Study Guide and Review</i> 462-463  <i>Practice Test</i> 465 #1-#13</p> <p><b>Teacher Edition:</b>            418b, 424b, 445b            A 423, 449; AE 419-420, 425-426, 446; SQ 445</p>

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<p>D.8.3 Determine measurement directly* using standard units (metric and US Customary) with these suggested degrees of accuracy</p> <ul style="list-style-type: none"> <li>lengths to the nearest mm or 1/16 of an inch</li> <li>weight (mass) to the nearest 0.1 g or 0.5 ounce</li> <li>liquid capacity to the nearest ml</li> <li>angles to the nearest degree</li> <li>temperature to the nearest C or F</li> <li>elapsed time to the nearest second</li> </ul>	<p><b>Student Edition:</b>  418-423, 424-429, 432-436, 437-441, 445-449, 450-454, 470-473, 534-538, 540-544, 548-553  <i>Measurement Lab</i> 430-431, 539  <i>Mid-Chapter Quiz</i> 444, 545  <i>Study Guide and Review</i> 462-464  <i>Practice Test</i> 465</p> <p><b>Teacher Edition:</b>  AE 419, 438; DI 428, 435, 454; PAA 538; SC 418, 450; TNT 433, 552</p>
<p>D.8.4 Determine measurements indirectly* using</p> <ul style="list-style-type: none"> <li>estimation</li> <li>conversion of units within a system (e.g., quarts to cups, millimeters to centimeters)</li> <li>ratio and proportion (e.g., similarity*, scale drawings*)</li> <li>geometric formulas to derive lengths, areas, volumes of common figures (e.g., perimeter, circumference, surface area)</li> <li>the Pythagorean* relationship</li> <li>geometric relationships and properties for angle size (e.g., parallel lines and transversals; sum of angles of a triangle; vertical angles*)</li> </ul>	<p><b>Student Edition:</b>  418-423, 424-429, 436 #42-#45, 445-449, 454 #34-#36, 455-458, 502-507, 534-538, 540-544, 548-553  <i>Measurement Lab</i> 430-431, 539  <i>Mid-Chapter Quiz</i> 444, 545  <i>Study Guide and Review</i> 462-463  <i>Practice Test</i> 465 #1-#13</p> <p><b>Teacher Edition:</b>  418b, 424b, 445b  A 423, 449, 507; AE 419-420, 425-426, 446, 503-504; PAA 538; SQ 445, 502</p>
<p><b>Mathematics Performance Standard E</b></p>	
<p>Mathematics, Standard E: Statistics and Probability  Performance Standards - Grade 8  By the end of <b>grade eight</b>, students will:</p>	
<p>E.8.1 Work with data in the context of real-world situations by:</p> <ul style="list-style-type: none"> <li>formulating questions that lead to data collection and analysis</li> <li>designing and conducting a statistical investigation</li> <li>using technology to generate displays, summary statistics*, and presentations</li> </ul>	<p><b>Student Edition:</b>  84 #11, 91 #20, 95 #17, 99 #19, 112 #17  <i>Spreadsheet Lab</i> 86-87  <i>Statistics Lab</i> 119-120</p> <p><b>Teacher Edition:</b>  A 120; T 119</p>

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<p>E.8.2 Organize and display data from statistical investigations using:</p> <ul style="list-style-type: none"> <li>• appropriate tables, graphs, and/or charts (e.g., circle, bar or line for multiple sets of data)</li> <li>• appropriate plots (e.g., line*, stem-and-leaf*, box*, scatter*)</li> </ul>	<p><b>Student Edition:</b>  81-85, 88-91, 92-95, 96-100  <i>Problem-Solving Investigation</i> 78-79  <i>Extend</i> 86-87  <i>Mid-Chapter Quiz</i> 101  <i>Study Guide and Review</i> 126-129  <i>Practice Test</i> 131</p> <p><b>Teacher Edition:</b>  81b, 88b, 92b  A 95; AE 82-83, 89, 93, 97; FMC 82, 89, 97; SC 81, 92, 96</p>
<p>E.8.3 Extract, interpret, and analyze information from organized and displayed data by using:</p> <ul style="list-style-type: none"> <li>• frequency and distribution, including mode* and range*</li> <li>• central tendencies* of data (mean* and median*)</li> <li>• indicators of dispersion (e.g., outliers*)</li> </ul>	<p><b>Student Edition:</b>  102-106, 108-113, 118 #20-#22, 125 #39-#40  <i>Spreadsheet Lab</i> 107  <i>Study Guide and Review</i> 129 #23-#28  <i>Practice Test</i> 131 #10-#11</p> <p><b>Teacher Edition:</b>  102b, 108b  A 106; AE 103, 109-110; FMC 103; SC 102, 108</p>
<p>E.8.4 Use the results of data analysis to:</p> <ul style="list-style-type: none"> <li>• make predictions</li> <li>• develop convincing arguments</li> <li>• draw conclusions</li> </ul>	<p><b>Student Edition:</b>  88-91, 95 #21-#24, 100 #26-#27, 114-118, 370-375, 380 #44  <i>Study Guide and Review</i> 128  <i>Get Ready for the Lesson</i> 377</p> <p><b>Teacher Edition:</b>  AE 371-372; DI 373; SC 88; TNT 88, 90</p>
<p>E.8.5 Compare several sets of data to generate, test, and, as the data dictate, confirm or deny hypotheses</p>	<p><b>Student Edition:</b>  85 #12, 88-91, 95 #18, 100 #27, 394-398  <i>Study Guide and Review</i> 409 #43-#44, 410 Ex #12</p> <p><b>Teacher Edition:</b>  AE 89, 395; FMC 395; PAA 395; SC 88, 394; TNT 88, 90</p>
<p>E.8.6 Evaluate presentations and statistical analyses from a variety of sources for:</p> <ul style="list-style-type: none"> <li>• credibility of the source</li> <li>• techniques of collection, organization, and presentation of data</li> <li>• missing or incorrect data</li> <li>• inferences</li> <li>• possible sources of bias</li> </ul>	<p><b>Student Edition:</b>  381-386, 389-393, 394-398  <i>Probability Lab</i> 387  <i>Mid-Chapter Quiz</i> 388 #20-#24  <i>Study Guide and Review</i> 408-409  <i>Practice Test</i> 411 #13-#21</p> <p><b>Teacher Edition:</b>  A 386, 398; AE 382-383; FMC 382; SQ 381</p>

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<p>E.8.7 Determine the likelihood of occurrence of simple events by:</p> <ul style="list-style-type: none"> <li>using a variety of strategies to identify possible outcomes (e.g., lists, tables, tree diagrams*)</li> <li>conducting an experiment</li> <li>designing and conducting simulations*</li> <li>applying theoretical notions of probability (e.g., that four equally likely events have a 25% chance of happening)</li> </ul>	<p><b>Student Edition:</b>  389-393, 394-398, 405 #36  <i>Probability Lab</i> 387  <i>Mid-Chapter Quiz</i> 388 #20-#24  <i>Study Guide and Review</i> 408-409  <i>Practice Test</i> 411 #13-#21</p> <p><b>Teacher Edition:</b>  A 386, 398; AE 382-383, 390, 395; FMC 382;  PAA 384; SQ 381, 389, 394</p>
<p><b>Mathematics Performance Standard F</b></p>	
<p>Mathematics, Standard F: Algebraic Relationships  Performance Standards - Grade 8  By the end of <b>grade eight</b>, students will:</p>	
<p>F.8.1 Work with algebraic expressions in a variety of ways, including</p> <ul style="list-style-type: none"> <li>using appropriate symbolism, including exponents* and variables*</li> <li>evaluating expressions through numerical substitution</li> <li>generating equivalent expressions</li> <li>adding and subtracting expressions</li> </ul>	<p><b>Student Edition:</b>  42-46, 53 #31-#33, 60 #42-#44, 63-67, 343-348, 636-641, 648 #36, 654 #39  <i>Algebra Lab</i> 61  <i>Study Guide and Review</i> 70-72, 664 #18-#28  <i>Practice Test</i> 73 #9-#11, #19-#20, 359 #17  <i>Mid-Chapter Quiz</i> 649 #11-#19</p> <p><b>Teacher Edition:</b>  42b  A 46; AE 43; FMC 43, 344; SC 42</p>
<p>F.8.2 Work with linear and nonlinear patterns* and relationships in a variety of ways, including</p> <ul style="list-style-type: none"> <li>representing them with tables, with graphs, and with algebraic expressions, equations, and inequalities</li> <li>describing and interpreting their graphical representations (e.g., slope*, rate of change, intercepts*)</li> <li>using them as models of real-world phenomena</li> <li>describing a real-world phenomenon that a given graph might represent</li> </ul>	<p><b>Student Edition:</b>  49-53, 57-60, 67 #36-#37, 343-348, 349-353  <i>Graphing Calculator Lab</i> 47-48  <i>Problem-Solving Investigation</i> 55 #10-#12, 341-342, 662 #7, #9  <i>Study Guide and Review</i> 71, 357-358  <i>Practice Test</i> 73</p> <p><b>Teacher Edition:</b>  AE 50, 344-345; DI 51; SC 49, 343; TNT 51</p>

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<p>F.8.3 Recognize, describe, and analyze functional relationships* by generalizing a rule that characterizes the pattern of change among variables. These functional relationships include exponential growth and decay (e.g., cell division, depreciation)</p>	<p><b>Student Edition:</b>  49-53, 233-237  <i>Graphing Calculator Lab</i> 47-48  <i>Study Guide and Review</i> 242  <i>Practice Test</i> 243</p> <p><b>Teacher Edition:</b>  A 237; AE 50, 234-235; PAA 235; SC 233</p>
<p>F.8.4 Use linear equations and inequalities in a variety of ways, including</p> <ul style="list-style-type: none"> <li>• writing them to represent problem situations and to express generalizations</li> <li>• solving them by different methods (e.g., informally, graphically, with formal properties, with technology)</li> <li>• writing and evaluating formulas (including solving for a specified variable)</li> <li>• using them to record and describe solution strategies</li> </ul>	<p><b>Student Edition:</b>  9, 42-46, 49-53, 57-60, 632-635, 636-641, 644-648, 651-654, 657-660  <i>Algebra Lab</i> 61-62  <i>Study Guide and Review</i> 70 #29, 71 #35-#36, 664-666  <i>Practice Test</i> 73 #15-#16, #20, 667  <i>Mid-Chapter Quiz</i> 649</p> <p><b>Teacher Edition:</b>  AE 43, 638, 646, 652, 658; SQ 42, 49, 57, 657</p>
<p>F.8.5 Recognize and use generalized properties and relations, including</p> <ul style="list-style-type: none"> <li>• additive and multiplicative property of equations and inequalities</li> <li>• commutativity* and associativity* of addition and multiplication</li> <li>• distributive* property</li> <li>• inverses* and identities* for addition and multiplication</li> <li>• transitive* property</li> </ul>	<p><b>Student Edition:</b>  632-635, 636-641, 644-648, 651-654, 748-750  <i>Algebra Lab</i> 630-631, 642-643, 655-656  <i>Mid-Chapter Quiz</i> 649  <i>Explore</i> 650  <i>Study Guide and Review</i> 663-666  <i>Chapter Test</i> 667</p> <p><b>Teacher Edition:</b>  A 635, 640; AE 633, 637; FMC 633, 645; SQ 632, 636; TNT 637</p>