



Math Connects

Concepts, Skills, and Problem Solving

Course 3

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| STANDARDS | PAGE REFERENCES |
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| <p>Mathematics Performance Standard A</p> | |
| <p>Mathematics, Standard A: Mathematical Processes Performance Standards - Grade 8 By the end of grade eight, students will:</p> | |
| <p>A.8.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> • evaluate information • perceive patterns • identify relationships • formulate questions for further exploration • evaluate strategies • justify statements • test reasonableness of results • defend work | <p>Student Edition: 26 Example 2, 49 #45, 203 #24, #26, 310 #37, 341 #16, 391 #18-#21, 403 #18, 468 #36, 499 #31, 587 #21, 596 #19, 615 #10-#19</p> <p>Teacher Edition: SQ 29; TT 56</p> |
| <p>A.8.2 Communicate logical arguments clearly to show why a result makes sense</p> | <p>Student Edition: 39 #43-#45, 45 #41, 56 #63-#64, 104 Example 5, 391 #18-#20, 468 #36, 596 #19-#20</p> <p><i>Algebra Lab</i> 40 #1-#4</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>Student Edition: 94 #35-#36, 115 Test Example <i>Problem-Solving Investigation</i> 124, 216, 272, 273 #6-#13, 360 Teacher Edition: 275a, 320a; TT 140</p> |
| <p>A.8.4 Develop effective oral and written presentations that include</p> <ul style="list-style-type: none"> • appropriate use of technology • the conventions of mathematical discourse (e.g., symbols, definitions, labeled drawings) • mathematical language • clear organization of ideas and procedures • understanding of purpose and audience | <p>Student Edition: 579 #19-#20 <i>Geometry Lab</i> 358-359 <i>Graphing Calculator Lab</i> 500-501, 544, 581 <i>Measurement Lab</i> 362 <i>Mini Lab</i> 96, 327, 352 <i>Spreadsheet Lab</i> 294, 397-398 Teacher Edition: 475a</p> |
| <p>A.8.5 Explain mathematical concepts, procedures, and ideas to others who may not be familiar with them</p> | <p>Student Edition: 100 #49, 111 #41-#42, 558 #41-#42 <i>Algebra Lab</i> 474 <i>Problem-Solving Investigation</i> 314, 360, 538 Teacher Edition: 263a, 320a, 559a</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>Student Edition: 29, 84-85, 144-145, 219, 263-264, 306-307, 416-417 <i>Reading to Solve Problems</i> 90, 154, 262 Teacher Edition: 304E <i>Study Skills</i>; 449a</p> |
| <p>Mathematics Performance Standard B</p> | |
| <p>Mathematics, Standard B: Number Operations and Relationships Performance Standards - Grade 8 By the end of grade eight, students will:</p> | |
| <p>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*)</p> | <p>Student Edition: 84-89, 95 #43, 101 #58-#60 <i>Reading to Solve Problems</i> 90 Teacher Edition: AE 85, 86; FM 85; PA 86; TT 84, 88</p> |

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| <p>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)</p> | <p>Student Edition: 96-101, 102-107, 108-112, 114-118</p> <p>Teacher Edition: 96a, 108a; A 101, 112; AE 97, 98, 103; DI 104; EA 100; PA 116</p> |
| <p>B.8.3 Generate and explain equivalencies among fractions, decimals, and percents</p> | <p>Student Edition: 84-89, 101 #58-#60, 252-255, 256-261</p> <p><i>Mid-Chapter Quiz</i> 113 #1-#3</p> <p><i>Study Guide and Review</i> 135 2-1</p> <p><i>Test Practice</i> 140 #2, #7</p> <p>Teacher Edition: 84a; A 89; AA 86, 253</p> |
| <p>B.8.4 Express order relationships among rational numbers using appropriate symbols (>, <, ≥, ≤, ≠)</p> | <p>Student Edition: 35, 91-95, 101 #55-#57, 107 #55</p> <p><i>Mid-Chapter Quiz</i> 113 #4-#8</p> <p>Teacher Edition: 91a; AE 92, 93; DI 93; T 35</p> |
| <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"> • ratios and proportions (e.g., rates, scale drawings*, similarity*) • percents, including those greater than 100 and less than one (e.g., discounts, rate of increase or decrease, sales tax) | <p>Student Edition: 190-193, 194-197, 198-203, 263-267</p> <p><i>Reading to Solve Problems</i> 262</p> <p>Teacher Edition: 190a, 194a, 198a; A 193; AE 191, 195, 199</p> |
| <p>B.8.6 Model* and solve problems involving number-theory concepts such as</p> <ul style="list-style-type: none"> • prime* and composite numbers • divisibility and remainders • greatest common factors • least common multiples | <p>Student Edition: 53, 91 Example 1, 97 Example 1, 102-104, 114</p> <p><i>Review Vocabulary</i> 97</p> <p>Teacher Edition: AE 53, 103, 104; FM 115</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"> • calculating mentally • estimating • creating, using, and explaining algorithms* • using technology (e.g., scientific calculators, spreadsheets) | <p>Student Edition: 97 Example 3, 107 #46-#47, 268-271, 275-278</p> <p><i>Spreadsheet Lab</i> 294, 397-398, 589-590</p> <p><i>Test-Taking Tip</i> 115</p> <p>Teacher Edition: 268a, 275a; A 271; AE 276; TNT 107; TT 140</p> |

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| Mathematics Performance Standard C | |
| <p>Mathematics, Standard C: Geometry Performance Standards - Grade 8</p> <p>By the end of grade eight, students will:</p> | |
| <p>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:</p> <ul style="list-style-type: none"> • naming, defining, and giving examples • comparing, sorting, and classifying them • identifying and contrasting their properties (e.g., symmetrical*, isosceles, regular) • drawing and constructing physical models to specifications • explaining how these figures are related to objects in the environment | <p>Student Edition: 218-223, 316-319, 320-323, 352-357, 368-372 <i>Concepts and Skills Bank</i> 737-739 <i>Geometry Lab</i> 224, 324-325, 358-359</p> <p>Teacher Edition: 316a, 352a; A 223, 319; FM 219, 317; TT 219</p> |
| <p>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).</p> | <p>Student Edition: 307, 320-321, 364-367, 368-372 <i>Concepts and Skills Bank</i> 738 <i>Geometry Lab</i> 224, 321-322 <i>Mini Lab</i> 218, 380</p> <p>Teacher Edition: A 223, 364, 365; FM 307; PA 381</p> |
| <p>C.8.3 Identify three-dimensional shapes from two-dimensional perspectives and draw two-dimensional sketches of three-dimensional objects preserving their significant features</p> | <p>Student Edition: 364 Example 2, 366 #11-#12, #17, 367 #18, #21, 368-372 <i>Measurement Lab</i> 385 <i>Mini Lab</i> 316, 380, 386</p> <p>Teacher Edition: 216a, 316a; TT 219</p> |
| <p>C.8.4 Perform transformations* on two-dimensional figures and describe and analyze the effects of the transformations on the figures</p> | <p>Student Edition: 225-230, 332-336, 337-341 <i>Spreadsheet Lab</i> 231</p> <p>Teacher Edition: AE 226, 227, 333, 338, 339; PA 227</p> |

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| C.8.5 Locate objects using the rectangular coordinate system* | Student Edition: 173-177, 225-230, 333-336 <i>Geometry Lab</i> 172 <i>Spreadsheet Lab</i> 231 Teacher Edition: A 341; AE 175, 333, 338; PA 333; T 337 |
| Mathematics Performance Standard D | |
| Mathematics, Standard D: Measurement Performance Standards - Grade 8 By the end of grade eight , students will: | |
| 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) | Student Edition: 173-179, 232-235 <i>Measurement Lab</i> 362 Teacher Edition: A 235; AE 175, 233; DI 234; FM 233; PA 233 |
| D.8.2 Demonstrate understanding of basic measurement facts, principles, and techniques including the following <ul style="list-style-type: none"> • 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) • knowledge that direct measurement* produces approximate, not exact, measures • the use of smaller units to produce more precise measures | Student Edition: 163 Example 2, 167 Example 1, 171 #24, 173-177 Example 6, 206 Example 3, 211 Example 1, 236-237 <i>Concepts and Skills Bank</i> 735-736, 742-745 Teacher Edition: AE 175 |
| D.8.3 Determine measurement directly* using standard units (metric and US Customary) with these suggested degrees of accuracy <ul style="list-style-type: none"> • lengths to the nearest mm or 1/16 of an inch • weight (mass) to the nearest 0.1 g or 0.5 ounce • liquid capacity to the nearest ml • angles to the nearest degree • temperature to the nearest C or F • elapsed time to the nearest second | Student Edition: 173-177 <i>Concepts and Skills Bank</i> 735-736, 742-745 <i>Study Guide and Review</i> 183 3-7 Teacher Edition: AE 174, 175; PA 175 |

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| <p>D.8.4 Determine measurements indirectly* using</p> <ul style="list-style-type: none"> estimation conversion of units within a system (e.g., quarts to cups, millimeters to centimeters) ratio and proportion (e.g., similarity*, scale drawings*) geometric formulas to derive lengths, areas, volumes of common figures (e.g., perimeter, circumference, surface area) the Pythagorean* relationship geometric relationships and properties for angle size (e.g., parallel lines and transversals; sum of angles of a triangle; vertical angles*) | <p>Student Edition: 162-166, 167-171, 232-235, 236-241, 306-311 <i>Concepts and Skills Bank</i> 735 <i>Geometry Lab</i> 161 <i>Measurement Lab</i> 362 Teacher Edition: A 235, 241; AE 163, 168, 233, 237, 238</p> |
| Mathematics Performance Standard E | |
| <p>Mathematics, Standard E: Statistics and Probability Performance Standards - Grade 8 By the end of grade eight, 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"> formulating questions that lead to data collection and analysis designing and conducting a statistical investigation using technology to generate displays, summary statistics*, and presentations | <p>Student Edition: 579 #19, 584 Example 3 <i>Graphing Calculator Lab</i> 516-517, 581, 611 <i>Spreadsheet Lab</i> 589-590, 597 Teacher Edition: EA 579</p> |
| <p>E.8.2 Organize and display data from statistical investigations using:</p> <ul style="list-style-type: none"> appropriate tables, graphs, and/or charts (e.g., circle, bar or line for multiple sets of data) appropriate plots (e.g., line*, stem-and-leaf*, box*, scatter*) | <p>Student Edition: 45 #49, 510-515, 576-580, 582-588, 605-610, 612-616 <i>Check</i> 15 <i>Concepts and Skills Bank</i> 749 <i>Graphing Calculator Lab</i> 516-517, 581, 611 <i>Problem-Solving Investigation</i> 574-575 <i>Spreadsheet Lab</i> 589-590 <i>Study Guide and Review</i> 522 9-9</p> |

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| <p>E.8.3 Extract, interpret, and analyze information from organized and displayed data by using:</p> <ul style="list-style-type: none"> • frequency and distribution, including mode* and range* • central tendencies* of data (mean* and median*) • indicators of dispersion (e.g., outliers*) | <p>Student Edition: 591-596, 599-604 <i>Concepts and Skills Bank</i> 751 <i>Spreadsheet Lab</i> 597</p> <p>Teacher Edition: 591a; AE 592, 593, 600, 601; PA 593</p> |
| <p>E.8.4 Use the results of data analysis to:</p> <ul style="list-style-type: none"> • make predictions • develop convincing arguments • draw conclusions | <p>Student Edition: 510-515 <i>Problem-Solving Investigation</i> 508</p> <p>Teacher Edition: AE 511, 512; T 510</p> |
| <p>E.8.5 Compare several sets of data to generate, test, and, as the data dictate, confirm or deny hypotheses</p> | <p>Student Edition: 576-577, 579 #15-#18, 583-585, 603 Example 3, 617-621 <i>Spreadsheet Lab</i> 589</p> <p>Teacher Edition: 574a; AE 577, 583, 607</p> |
| <p>E.8.6 Evaluate presentations and statistical analyses from a variety of sources for:</p> <ul style="list-style-type: none"> • credibility of the source • techniques of collection, organization, and presentation of data • missing or incorrect data • inferences • possible sources of bias | <p>Student Edition: 591-595 <i>Graphing Calculator Lab</i> 581 <i>Problem-Solving Investigation</i> 574 <i>Spreadsheet Lab</i> 589, 597</p> <p>Teacher Edition: 574a; AE 592</p> |
| <p>E.8.7 Determine the likelihood of occurrence of simple events by:</p> <ul style="list-style-type: none"> • using a variety of strategies to identify possible outcomes (e.g., lists, tables, tree diagrams*) • conducting an experiment • designing and conducting simulations* • applying theoretical notions of probability (e.g., that four equally likely events have a 25% chance of happening) | <p>Student Edition: 632-636, 642 #37, 643-647, 653-658 <i>Probability Lab</i> 648</p> <p>Teacher Edition: 632a; A 636; AE 633, 654; DI 635</p> |

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| Mathematics Performance Standard F | |
| Mathematics, Standard F: Algebraic Relationships Performance Standards - Grade 8 By the end of grade eight , students will: | |
| F.8.1 Work with algebraic expressions in a variety of ways, including <ul style="list-style-type: none"> • using appropriate symbolism, including exponents* and variables* • evaluating expressions through numerical substitution • generating equivalent expressions • adding and subtracting expressions | Student Edition: 31, 32 #10, 43, 53 Example 7, 61 #27, 65-66, 69 #28, 70, 102-103, 119-120, 210 Teacher Edition: DI 53; PA 45, 71 |
| F.8.2 Work with linear and nonlinear patterns* and relationships in a variety of ways, including <ul style="list-style-type: none"> • representing them with tables, with graphs, and with algebraic expressions, equations, and inequalities • describing and interpreting their graphical representations (e.g., slope*, rate of change, intercepts*) • using them as models of real-world phenomena • describing a real-world phenomenon that a given graph might represent | Student Edition: 25-28, 33 #39-#40, 138 #17-#18, 319 #23, 464-467 <i>Mini Lab</i> 24, 29, 316 <i>Problem-Solving Investigation</i> 124-125 Teacher Edition: 469a; AE 124, 465; SQ 316 |
| 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) | Student Edition: 475-480, 528-533, 534-537, 540-543 <i>Graphing Calculator Lab</i> 500-501, 544 <i>Study Guide and Review</i> 519 9-3 Teacher Edition: 528a; AE 476, 477, 535, 541; FM 476, 541 |
| F.8.4 Use linear equations and inequalities in a variety of ways, including <ul style="list-style-type: none"> • writing them to represent problem situations and to express generalizations • solving them by different methods (e.g., informally, graphically, with formal properties, with technology) • writing and evaluating formulas (including solving for a specified variable) • using them to record and describe solution strategies | Student Edition: 206, 422, 429, 442, 470 Example 3, 475-479 <i>Algebra Lab</i> 432-433 <i>Problem-Solving Investigation</i> 216-217 Teacher Edition: 65a, 469a; AE 477 |

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| <p>F.8.5 Recognize and use generalized properties and relations, including</p> <ul style="list-style-type: none"> • additive and multiplicative property of equations and inequalities • commutativity* and associativity* of addition and multiplication • distributive* property • inverses* and identities* for addition and multiplication • transitive* property | <p>Student Edition: 29, 31-32, 39 #51-#53, 43, 53, 65-66, 70-71 <i>Study Tip</i> 30</p> <p>Teacher Edition: AE 43; FM 30, 66; PA 32, 71</p> |