



MathMatters 2

An Integrated Program

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STANDARDS	PAGE REFERENCES
<p>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.</p>	
<p>Building upon knowledge and skills gained in preceding grades, by the end of Grade 12, students will:</p>	
<p>A. Number Sense</p>	
<p>1. Extend understanding of the number system to all real numbers.</p>	<p>Student Edition: 52-55, 85 #61-#62, 86-89, 107 #40-#43, 136-139, 484-487, 504-507, 520-523 <i>Are You Ready?</i> 50-51, 102-103 <i>MathWorks</i> 61 Annotated Teacher Edition: ETL 51; GS 52; LW 54 Teacher Resources: <i>Chapter 2 Resource Masters</i> 37 <i>Chapter 3 Resource Masters</i> 96</p>
<p>2. Compare and order rational and irrational numbers.</p>	<p>Student Edition: 52-55, 85 #52-#53, 93 #26-#28, 126-129, 132-135 <i>Are You Ready?</i> 103 Annotated Teacher Edition: ETL 37; TT 126, 127 Teacher Resources: <i>Chapter 2 Resource Masters</i> 37</p>

STANDARDS	PAGE REFERENCES
3. Develop conjectures and informal proofs of properties of number systems and sets of numbers.	Student Edition: 75 #64, 85 #52-#53, 86, 89 #51, 135 #50, 520-523 Annotated Teacher Edition: DI 136; TT 72, 86 Teacher Resources: <i>Chapter 2 Resource Masters 37</i> <i>Chapter 3 Resource Masters 90</i>
B. Numerical Operations	
1. Extend understanding and use of operations to real numbers and algebraic procedures.	Student Edition: 13 #29-#44, 27 #11-#25, 31 #30-#38, 37 #24-#32, 56-59, 66-69, 72-75, 76-79, 82-85, 86-89, 108-111, 116-119, 122-125 <i>Are You Ready?</i> 50-51 <i>MathWorks</i> 81 Annotated Teacher Edition: ETL 57; TT 56, 67 Teacher Resources: <i>Chapter 2 Resource Masters 40, 46, 58</i> <i>Chapter 3 Resource Masters 96</i>
2. Develop, apply, and explain methods for solving problems involving rational and negative exponents.	Student Edition: 82-85, 86-89, 115 #30-#35, 129 #57-#64, 135 #51-#56, 136-139, 155 #19-#26 Annotated Teacher Edition: AA 88; ETL 107; PE 83; TT 82, 86 Teacher Resources: <i>Chapter 2 Resource Masters 55, 58</i>
3. Perform operations on matrices. <ul style="list-style-type: none"> • Addition and subtraction • Scalar multiplication 	Student Edition: 38-41, 354-357 Annotated Teacher Edition: ETL 39; TT 38
4. Understand and apply the laws of exponents to simplify expressions involving numbers raised to powers.	Student Edition: 82-85, 86-89, 115 #30-#35, 129 #57-#64, 135 #51-#56, 136-139, 155 #19-#26 Annotated Teacher Edition: AA 88; ETL 107; PE 83; TT 82, 86 Teacher Resources: <i>Chapter 2 Resource Masters 55, 58</i>

STANDARDS	PAGE REFERENCES
C. Estimation	
1. Recognize the limitations of estimation, assess the amount of error resulting from estimation, and determine whether the error is within acceptable tolerance limits.	This standard can be integrated throughout the lesson. Student Edition: 508-509 <i>Are You Ready?</i> 5 Annotated Teacher Edition: CE 509
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.	
A. Geometric Properties	
1. Use geometric models to represent real-world situations and objects and to solve problems using those models (e.g., use Pythagorean theorem to decide whether an object can fit through a doorway).	Student Edition: 474-477, 478-481, 484-487, 488-491, 494-497, 498-501, 504-507, 508-509 <i>Chapter Investigation</i> 471, 481 #22, 497 #28, 501 #38 <i>MathWorks</i> 483, 503 Annotated Teacher Edition: DI 432; ETL 480; TT 478 Teacher Resources: <i>Chapter 11 Resource Masters</i> 352, 355
2. Draw perspective views of 3D objects on isometric dot paper, given 2D representations (e.g., nets or projective views).	Student Edition: 422-425, 426-429, 436-439, 442-445, 446-449 <i>MathWorks</i> 431, 451 Annotated Teacher Edition: AA 426; DI 432; ETL 443; FG 446 Teacher Resources: <i>Chapter 10 Resource Masters</i> 314, 323

STANDARDS	PAGE REFERENCES
<p>3. Apply the properties of geometric shapes.</p> <ul style="list-style-type: none"> • Parallel lines - transversal, alternate interior angles, corresponding angles • Triangles <ol style="list-style-type: none"> a. Conditions for congruence b. Segment joining midpoints of two sides is parallel to and half the length of the third side c. Triangle inequality • Minimal conditions for a shape to be a special quadrilateral • Circles - arcs, central and inscribed angles, chords, tangents • Self-similarity 	<p>Student Edition: 202-205, 206-209, 212-215, 216-219, 226-229 <i>MathWorks</i> 221</p> <p>Annotated Teacher Edition: DI 212; ETL 214, 216, 219, 228; TT 207, 213, 220, 221</p> <p>Teacher Resources: <i>Chapter 5 Resource Masters</i> 147, 153, 162</p>
<p>4. Use reasoning and some form of proof to verify or refute conjectures and theorems.</p> <ul style="list-style-type: none"> • Verification or refutation of proposed proofs • Simple proofs involving congruent triangles • Counterexamples to incorrect conjectures 	<p>Student Edition: 212-215, 218 #30, 530-531, 532-535, 548-551</p> <p>Annotated Teacher Edition: DI 212, 548; ETL 214; TT 213</p> <p>Teacher Resources: <i>Chapter 5 Resource Masters</i> 153</p>
<p>B. Transforming Shapes</p>	
<p>1. Determine, describe, and draw the effect of a transformation, or a sequence of transformations, on a geometric or algebraic object, and, conversely, determine whether and how one object can be transformed to another by a transformation or a sequence of transformations.</p>	<p>Student Edition: 296-299, 300-303, 306-309, 316-319, 320-321, 359 #13-#18, 455 #39-#42 <i>MathWorks</i> 305, 323</p> <p>Annotated Teacher Edition: ETL 297, 301, 307</p> <p>Teacher Resources: <i>Chapter 7 Resource Masters</i> 220, 229, 232</p>
<p>2. Recognize three-dimensional figures obtained through transformations of two-dimensional figures (e.g., cone as rotating an isosceles triangle about an altitude), using software as an aid to visualization.</p>	<p>Student Edition: 422-425, 426-429 <i>MathWorks</i> 431</p> <p>Teacher Resources: <i>Chapter 10 Resource Masters</i> 317</p>
<p>3. Determine whether two or more given shapes can be used to generate a tessellation.</p>	<p>Student Edition: 320-321</p> <p>Teacher Resources: <i>Chapter 7 Resource Masters</i> 230, 231, 232</p>

STANDARDS	PAGE REFERENCES
<p>4. Generate and analyze iterative geometric patterns.</p> <ul style="list-style-type: none"> • Fractals (e.g., Sierpinski's Triangle) • Patterns in areas and perimeters of self-similar figures • Outcome of extending iterative process indefinitely 	<p>Student Edition: 92-93</p> <p>Teacher Resources: <i>Chapter 2 Resource Masters 61</i></p>
<p>C. Coordinate Geometry</p>	
<p>1. Use coordinate geometry to represent and verify properties of lines.</p> <ul style="list-style-type: none"> • Distance between two points • Midpoint and slope of a line segment • Finding the intersection of two lines • Lines with the same slope are parallel • Lines that are perpendicular have slopes whose product is -1 	<p>Student Edition: 244-247, 248-251, 334-337, 338-341 <i>MathWorks 343</i></p> <p>Annotated Teacher Edition: AA 246; ETL 245; TT 334, 335, 338, 339</p> <p>Teacher Resources: <i>Chapter 6 Resource Masters 179, 182</i> <i>Chapter 8 Resource Masters 245, 248</i></p>
<p>2. Show position and represent motion in the coordinate plane using vectors.</p> <ul style="list-style-type: none"> • Addition and subtraction of vectors 	<p>Vectors fall outside the scope of this text but can be covered during teacher/class discussion.</p>
<p>D. Units of Measurement</p>	
<p>1. Understand and use the concept of significant digits.</p>	<p>Student Edition: 86-89</p> <p>Annotated Teacher Edition: AA 88</p>
<p>2. Choose appropriate tools and techniques to achieve the specified degree of precision and error needed in a situation.</p> <ul style="list-style-type: none"> • Degree of accuracy of a given measurement tool • Finding the interval in which a computed measure (e.g., area or volume) lies, given the degree of precision of linear measurements 	<p>Student Edition: This skill can be integrated into the lessons on pages 196-199 and throughout Chapter 10.</p>

STANDARDS	PAGE REFERENCES
E. Measuring Geometric Objects	
<p>1. Use techniques of indirect measurement to represent and solve problems.</p> <ul style="list-style-type: none"> • Similar triangles • Pythagorean theorem • Right triangle trigonometry (sine, cosine, tangent) 	<p>Student Edition: 474-477, 478-481, 484-487, 488-491, 494-497, 498-501, 504-507, 508-509 <i>MathWorks</i> 483, 503</p> <p>Annotated Teacher Edition: ETL 480; TT 478</p> <p>Teacher Resources: <i>Chapter 11 Resource Masters</i> 352, 355, 358, 367</p>
<p>2. Use a variety of strategies to determine perimeter and area of plane figures and surface area and volume of 3D figures.</p> <ul style="list-style-type: none"> • Approximation of area using grids of different sizes • Finding which shape has minimal (or maximal) area, perimeter, volume, or surface area under given conditions using graphing calculators, dynamic geometric software, and/or spreadsheets • Estimation of area, perimeter, volume, and surface area 	<p>Student Edition: 426-429, 432-435, 452-455, 456-459 <i>Are You Ready?</i> 148 and 420-421 (area is mentioned) <i>MathWorks</i> 431</p> <p>Annotated Teacher Edition: FG 435; TT 427</p> <p>Teacher Resources: <i>Chapter 10 Resource Masters</i> 314</p>
<p>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.</p>	
A. Patterns	
<p>1. Use models and algebraic formulas to represent and analyze sequences and series.</p> <ul style="list-style-type: none"> • Explicit formulas for n^{th} terms • Sums of finite arithmetic series • Sums of finite and infinite geometric series 	<p>Student Edition: 92-93 <i>Are You Ready?</i> 243</p> <p>Annotated Teacher Edition: ETL 541</p> <p>Teacher Resources: <i>Chapter 1 Resource Masters</i> 24 <i>Chapter 2 Resource Masters</i> can be used to extend the lesson on 43 to meet this standard.</p>
<p>2. Develop an informal notion of limit.</p>	<p>Annotated Teacher Edition: ETL 226</p>

STANDARDS	PAGE REFERENCES
3. Use inductive reasoning to form generalizations.	Student Edition: Use the introduction to the lessons on pages 82, 86, 206, 216, 254, 334, 452, 488. 92-93, 274-275, 538-541 Annotated Teacher Edition: ETL 538
B. Functions and Relationships	
1. Understand relations and functions and select, convert flexibly among, and use various representations for them, including equations or inequalities, tables, and graphs.	Student Edition: 248-251, 254-257, 258-261, 264-267, 268-271, 274-275, 276-279, 282-285 <i>MathWorks</i> 273 Annotated Teacher Edition: TT 254, 265 Teacher Resources: <i>Chapter 6 Resource Masters</i> 185, 188, 194
2. Analyze and explain the general properties and behavior of functions of one variable, using appropriate graphing technologies. <ul style="list-style-type: none"> • Slope of a line or curve • Domain and range • Intercepts • Continuity • Maximum/minimum • Estimating roots of equations • Intersecting points as solutions of systems of equations • Rates of change 	Student Edition: 248-251, 254-257, 264-267, 268-271, 271 #39, 274-275, 276-279, 282-285, 334-337, 338-341 <i>MathWorks</i> 273 Annotated Teacher Edition: TT 254, 334, 338 Teacher Resources: <i>Chapter 6 Resource Masters</i> 182, 197 <i>Chapter 8 Resource Masters</i> 248
3. Understand and perform transformations on commonly-used functions. <ul style="list-style-type: none"> • Translations, reflections, dilations • Effects on linear and quadratic graphs of parameter changes in equations • Using graphing calculators or computers for more complex functions 	Student Edition: 254 & 334 (lesson introductions), 270 #31-#47, 296-299, 300-303, 316-319 <i>MathWorks</i> 305 Annotated Teacher Edition: ETL 297, 301; TT 334 Teacher Resources: <i>Chapter 6 Resource Masters</i> 194

STANDARDS	PAGE REFERENCES
<p>4. Understand and compare the properties of classes of functions, including exponential, polynomial, rational, and trigonometric functions.</p> <ul style="list-style-type: none"> • Linear vs. non-linear • Symmetry • Increasing/decreasing on an interval 	<p>Linear and quadratic components can be found:</p> <p>Student Edition: 248-251, 264-267, 268-271</p>
<p>C. Modeling</p>	
<p>1. Use functions to model real-world phenomena and solve problems that involve varying quantities.</p> <ul style="list-style-type: none"> • Linear, quadratic, exponential, periodic (sine and cosine), and step functions (e.g., price of mailing a first-class letter over the past 200 years) • Direct and inverse variation • Absolute value • Expressions, equations and inequalities • Same function can model variety of phenomena • Growth/decay and change in the natural world • Applications in mathematics, biology, and economics (including compound interest) 	<p>Student Edition: 107 #36-#38, 111 #47, 114-115, 119 #46, 122-125, 251 #36-#40, 257 #34-#37, 261 #37, #44, 267 #23-#26, 268-271, 274-275, 276-279, 282-285</p> <p><i>MathWorks</i> 113, 273</p> <p>Annotated Teacher Edition: ETL 277, 284, 285; TT 281</p> <p>Teacher Resources: <i>Chapter 6 Resource Masters</i> 191, 200, 203</p>
<p>2. Analyze and describe how a change in an independent variable leads to change in a dependent one.</p>	<p>Student Edition: 264-267, 268-271, 274-275, 276-279, 282-285</p> <p>Annotated Teacher Edition: AA 279</p>
<p>3. Convert recursive formulas to linear or exponential functions (e.g., Tower of Hanoi and doubling).</p>	<p>Student Edition: 82 (lesson introduction)</p> <p>Annotated Teacher Edition:</p> <p>Teacher Resources: <i>Chapter 2 Resource Masters</i> 43 (when extended by the teacher), 61</p>

STANDARDS	PAGE REFERENCES
D. Procedures	
1. Evaluate and simplify expressions. <ul style="list-style-type: none"> • Add and subtract polynomials • Multiply a polynomial by a monomial or binomial • Divide a polynomial by a monomial 	Student Edition: 376-379, 380-383, 386-389, 390-393, 396-399 Annotated Teacher Edition: AA 389; DI 386, 396; ETL 382, 398; TT 378, 387, 391 Teacher Resources: <i>Chapter 9 Resource Masters 283, 289</i>
2. Select and use appropriate methods to solve equations and inequalities. <ul style="list-style-type: none"> • Linear equations - algebraically • Quadratic equations - factoring (when the coefficient of x^2 is 1) and using the quadratic formula • All types of equations using graphing, computer, and graphing calculator techniques 	Student Edition: 104-107, 108-111, 116-119, 122-125, 132-135, 136-139 <i>MathWorks 113, 131</i> Annotated Teacher Edition: DI 116; ETL 138; PE 123; TT 105, 124 Teacher Resources: <i>Chapter 3 Resource Masters 78, 93</i>
3. Judge the meaning, utility, and reasonableness of the results of symbol manipulations, including those carried out by technology.	Student Edition: 66-69, 72-75, 76-79, 82-85, 86-89 <i>MathWorks 81</i> Annotated Teacher Edition: AA 84; DI 77; ETL 79; PE 83; TT 72, 76, 80, 81, 86, 90
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.	
A. Data Analysis	
1. Use surveys and sampling techniques to generate data and draw conclusions about large groups. <ul style="list-style-type: none"> • Advantages/disadvantages of sample selection methods (e.g., convenience sampling, responses to survey, random sampling) 	Student Edition: 6-9 <i>Chapter Investigation 3, 9 #29</i> Annotated Teacher Edition: ETL 7; TT 6

STANDARDS	PAGE REFERENCES
<p>2. Evaluate the use of data in real-world contexts.</p> <ul style="list-style-type: none"> • Accuracy and reasonableness of conclusions drawn • Bias in conclusions drawn (e.g., influence of how data is displayed) • Statistical claims based on sampling 	<p>Student Edition: 6-9, 34-37 <i>MathWorks</i> 15</p> <p>Annotated Teacher Edition: AA 34; ETL 7, 35</p> <p>Teacher Resources: <i>Chapter 1 Resource Masters</i> 21</p>
<p>3. Design a statistical experiment, conduct the experiment, and interpret and communicate the outcome.</p>	<p>Student Edition: <i>Chapter Investigation</i> 3, 9 #29, 31 #29, 37 #20</p>
<p>4. Estimate or determine lines of best fit (or curves of best fit if appropriate) with technology, and use them to interpolate within the range of the data.</p>	<p>Student Edition: 20-23, 26-27</p> <p>Annotated Teacher Edition: DI 20; ETL 21, 27; TT 26</p> <p>Teacher Resources: <i>Chapter 1 Resource Masters</i> 12, 15</p>
<p>5. Analyze data using technology, and use statistical terminology to describe conclusions.</p> <ul style="list-style-type: none"> • Measures of dispersion: variance, standard deviation, outliers • Correlation coefficient • Normal distribution (e.g., approximately 95% of the sample lies between two standard deviations on either side of the mean) 	<p>Student Edition: 10-13, 20-23, 26-27, 28-31 <i>MathWorks</i> 33</p> <p>Annotated Teacher Edition: ETL 27; TT 26</p> <p>Teacher Resources: <i>Chapter 1 Resource Masters</i> 6, 12, 15, 18</p>
<p>B. Probability</p>	
<p>1. Calculate the expected value of a probability-based game, given the probabilities and payoffs of the various outcomes, and determine whether the game is fair.</p>	<p>Student Edition: 171 #29 <i>Chapter Investigation</i> 147, 161 #28, 171 #30, 181 #29</p> <p>Teacher Resources: <i>Chapter 4 Resource Masters</i> 109 (when extended by the teacher)</p>
<p>2. Use concepts and formulas of area to calculate geometric probabilities.</p>	<p>Student Edition: 150-153</p> <p>Annotated Teacher Edition: AA 153; CE 151</p>

STANDARDS	PAGE REFERENCES
3. Model situations involving probability with simulations (using spinners, dice, calculators and computers) and theoretical models, and solve problems using these models.	Student Edition: 150 (introduction), 154-155 Annotated Teacher Edition: TT 158 Teacher Resources: <i>Chapter 4 Resource Masters 112</i>
4. Determine probabilities in complex situations. <ul style="list-style-type: none"> • Conditional events • Complementary events • Dependent and independent events 	Student Edition: 162-165, 168-171 Annotated Teacher Edition: ETL 169 Teacher Resources: <i>Chapter 4 Resource Masters 118, 121</i>
5. Estimate probabilities and make predictions based on experimental and theoretical probabilities.	Student Edition: 150-153, 154-155, 158-161, 162-165, 168-171, 178-181 <i>MathWorks 157, 177</i> Annotated Teacher Edition: AA 153; ETL 163, 169; TT 158 Teacher Resources: <i>Chapter 4 Resource Masters 109, 112</i>
6. Understand and use the “law of large numbers” (that experimental results tend to approach theoretical probabilities after a large number of trials).	Student Edition: 150-153, 154-155
C. Discrete Mathematics -- Systematic Listing and Counting	
1. Calculate combinations with replacement (e.g., the number of possible ways of tossing a coin 5 times and getting 3 heads) and without replacement (e.g., number of possible delegations of 3 out of 23 students).	The following pages can be used to integrate this concept. Student Edition: 178-181
2. Apply the multiplication rule of counting in complex situations, recognize the difference between situations with replacement and without replacement, and recognize the difference between ordered and unordered counting situations.	Student Edition: 158-161, 168-171, 172-175, 178-181 Annotated Teacher Edition: CE 159; ETL 169; TT 158, 172, 173 Teacher Resources: <i>Chapter 4 Resource Masters 118</i>
3. Justify solutions to counting problems.	Student Edition: 172-175, 178-181

STANDARDS	PAGE REFERENCES
4. Recognize and explain relationships involving combinations and Pascal's Triangle, and apply those methods to situations involving probability.	Extend the following lesson to include these concepts. Student Edition: 178-181
D. Discrete Mathematics -- Vertex-Edge Graphs and Algorithms	
1. Use vertex-edge graphs and algorithmic thinking to represent and solve practical problems. <ul style="list-style-type: none"> • Circuits that include every edge in a graph • Circuits that include every vertex in a graph • Scheduling problems (e.g., when project meetings should be scheduled to avoid conflicts) using graph coloring • Applications to science (e.g., who-eats-whom graphs, genetic trees, molecular structures) 	Student Edition: 358-359 Annotated Teacher Edition: CE 359 Teacher Resources: <i>Chapter 8 Resource Masters 260</i>
2. Explore strategies for making fair decisions. <ul style="list-style-type: none"> • Combining individual preferences into a group decision (e.g., determining winner of an election or selection process) • Determining how many Student Council representatives each class (9th, 10th, 11th, and 12th grade) gets when the classes have unequal sizes (apportionment) 	This standard can be met during teacher/classroom discussion of making fair decisions.
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.	
Cumulative Progress Indicators At each grade level, with respect to content appropriate for that grade level, students will:	
A. Problem Solving	
1. Learn mathematics through problem solving, inquiry, and discovery.	Use the introductions found on the following pages. Student Edition: 56, 72, 86, 150, 202, 206, 226, 334, 408, 452, 474, 488 Also see 114-115, 154-155

STANDARDS	PAGE REFERENCES
<p>2. Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3).</p> <ul style="list-style-type: none"> • Open-ended problems • Non-routine problems • Problems with multiple solutions • Problems that can be solved in several ways 	<p>Student Edition: 13 #28, 19 #28, 37 #19, 65 #60, 111 #57, 129 #48, 139 #57, 195 #3, 251 #36-40, 257 #39, 347 #38, 411 #64 <i>Are You Ready?</i> 519 <i>MathWorks</i> 15 #6, 61 #3</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>Student Edition: 26-27, 92-93, 114-115, 154-155, 274-275, 320-321, 358-259, 400-401, 462-463, 508-509, 530-531</p>
<p>4. Pose problems of various types and levels of difficulty.</p>	<p>Student Edition: <i>Chapter Investigation</i> 9 #29 Teachers can ask students to do this type of questioning when working through this textbook.</p>
<p>5. Monitor their progress and reflect on the process of their problem-solving activity.</p>	<p>Similar scenarios to this standard that prompt students to summarize what they have learned are found on the following pages. Student Edition: 31 #23, 37 #17, 69 #46, 110 #43, 138 #13, 152 #11, 161 #20, 165 #26, 171 #21, 180 #19, 215 #26, 225 #36</p>
<p>B. Communication</p>	
<p>1. Use communication to organize and clarify their mathematical thinking.</p> <ul style="list-style-type: none"> • Reading and writing • Discussion, listening, and questioning 	<p>Student Edition: 9 #25, 12 #11, 19 #22, 31 #23, 37 #17, 58 #26, 110 #43, 118 #10, 125 #41, 128 #17, 134 #10, 161 #20, 171 #21, 180 #19</p>
<p>2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.</p>	<p>Student Edition: 19 #16, 23 #13, 69 #45, 74 #15, 106 #20, 115 #20, 124 #10, 152 #11, 161 #16, 164 #8, 165 #26, 170 #8</p>
<p>3. Analyze and evaluate the mathematical thinking and strategies of others.</p>	<p>Student Edition: 75 #59, 79 #46, 111 #45, 215 #25, 218 #30, 246 #18, 341 #33, 357 #28, 382 #50, 399 #41, 411 #55, 424 #32, 477 #23, 541 #26</p>
<p>4. Use the language of mathematics to express mathematical ideas precisely.</p>	<p>Student Edition: 74 #15, 78 #10, 118 #10, 138 #13, 175 #24, 180 #19, 212-215, 256 #15, 261 #38, 267 #22, 275 #14, 336 #19, 347 #23, 548-551 Teacher Resources: <i>Chapter 5 Resource Masters</i> 153</p>

STANDARDS	PAGE REFERENCES
C. Connections	
1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	Student Edition: 59 #31-#34, 64 #42-#44, 72 and 86 (introductions), 92-93, 274-275, 275 #14, 390-393, 542-545
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).	Student Edition: Introductions on 86, 108, and 268, 334-337, 338-341, 351 #31-#33, 358-359, 390-393 Annotated Teacher Edition: AA 246; TT 339 Teacher Resources: <i>Chapter 8 Resource Masters 263</i>
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	Student Edition: 107 #36-#38, 125 #50-#51, 139 #55, 171 #26-#28, 270 #19-#23, 282-285, 321 #17, 351 #26 <i>Chapter Investigation 101, 119 #56, 139 #58</i>
4. Apply mathematics in practical situations and in other disciplines.	Student Edition: <i>MathWorks 61, 81, 113, 131, 157, 177, 201, 221, 323, 343, 361, 385</i> Annotated Teacher Edition: ETL 282, 285 Teacher Resources: <i>Chapter 8 Resource Masters 263</i>
5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).	Student Edition: 62 (introduction) Annotated Teacher Edition: ETL 227
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Student Edition: 59 #31-#34, 64 #42-#44, Introductions on 72 and 86, 92-93, 274-275, 275 #14, 390-393, 542-545
D. Reasoning	
1. Recognize that mathematical facts, procedures, and claims must be justified.	Student Edition: 75 #64, 111 #45, 129 #48, 134 #10, 212-215, 219 #49, 225 #34-#35, 279 #27, 484 and 488 (introductions), 548-551 Annotated Teacher Edition: AA 240 Teacher Resources: <i>Chapter 5 Resource Masters 151, 152, 153</i> <i>Chapter 12 Resource Masters 399, 400</i>

STANDARDS	PAGE REFERENCES
2. Use reasoning to support their mathematical conclusions and problem solutions.	Student Edition: 165 #25, 171 #29, 175 #30, 215 #27, 219 #49, 229 #30, 251 #36-#40, 267 #22, 313 #30, 319 #20, 341 #29-#32, 347 #38, 399 #46, 487 #28
3. Select and use various types of reasoning and methods of proof.	Student Edition: 68 Example 4, 75 #64, Introduction on 86, 118 Example 4, 154-155, 212-215, 219 #49, Introduction on 452 Annotated Teacher Edition: ETL 214, 458 Teacher Resources: <i>Chapter 5 Resource Masters 151,152, 153</i> <i>Chapter 12 Resource Masters 399, 400</i>
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.	The teacher will meet this standard by encouraging students throughout the learning process.
5. Make and investigate mathematical conjectures. <ul style="list-style-type: none"> • Counterexamples as a means of disproving conjectures • Verifying conjectures using informal reasoning or proofs 	Student Edition: 86 (introduction), 195 #31, 212-215, 530-531, 532-535, 538-541, 548-551 Annotated Teacher Edition: DI 548; ETL 214 Teacher Resources: <i>Chapter 5 Resource Masters 151,152, 153</i> <i>Chapter 12 Resource Masters 399, 400</i>
6. Evaluate examples of mathematical reasoning and determine whether they are valid.	Student Edition: 75 #59, 79 #46, 111 #45, 175 #26, 215 #25, 218 #30, 246 #18, 341 #33, 357 #28, 382 #50, 399 #41, 411 #55, 424 #32, 477 #23, 541 #26
E. Representations	
1. Create and use representations to organize, record, and communicate mathematical ideas. <ul style="list-style-type: none"> • Concrete representations (e.g., base-ten blocks or algebra tiles) • Pictorial representations (e.g., diagrams, charts, or tables) • Symbolic representations (e.g., a formula) • Graphical representations (e.g., a line graph) 	Student Edition: 16-19, 20-23, 28-31, 38-41, 68 Example 4, Introduction on 72, 114-115, 126-129, 244-247, 254-257, 258-261, 282-285, 354-357, 358-359, 381 Example 2 Annotated Teacher Edition: DI 136

STANDARDS	PAGE REFERENCES
2. Select, apply, and translate among mathematical representations to solve problems.	<p>Student Edition: 16-19, 20-23, 34-37, 82 and 86 (introductions), 114-115, 250 #13-#20, 254-257, 268-271, 351 #31-#33, 354-357</p> <p>Annotated Teacher Edition: ETL 180, 223; TT 72</p> <p>Teacher Resources: <i>Chapter 8 Resource Masters 263</i></p>
3. Use representations to model and interpret physical, social, and mathematical phenomena.	<p>Student Edition: 16-19, 20-23, 28-31, 33-37, 52-55, 116-119, 122-125, 135 #46, 261 #44, 268-271, 276-279</p> <p><i>MathWorks</i> 33, 61, 81, 113</p>
F. Technology	
1. Use technology to gather, analyze, and communicate mathematical information.	<p>Student Edition: 11 Example 2, 21 Example 3, 26, 39 Example 3, 205 #36, 215 #28, 229 #27-#28, 260 Example 3, 264-267, 319 #25, 340 Example 4, 435 #21</p> <p>Annotated Teacher Edition: TT 338</p>
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.	<p>Student Edition: 16 Example 1, 21 Example 2, 29 Example 2, 75 #55-57, 248, 425 #41-#45, 435 #21, 459 #31</p>
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.	<p>Student Edition: 260 Example 3, 264-267, 268-271, 340 Example 4</p> <p>Annotated Teacher Edition: TT 338</p>
4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).	<p>Student Edition: 26-27, 39 Example 3, 58 #11, 116-119, 136-139, 197 Example 3, 205 #36, 229 #27-#28, 248, 260 Example 3, Introduction on 334, 347 #31-#34</p>
5. Use computer software to make and verify conjectures about geometric objects.	<p>Student Edition: 197 Example 3, 205 #36, 215 #28, 229 #27-#28, 299 #26, 303 #30, 425 #41-#45</p>
6. Use computer-based laboratory technology for mathematical applications in the sciences.	<p>This standard can be met during teacher/classroom discussion.</p>