

**GLENCOE CORRELATION**  
**MATHEMATICS: APPLICATIONS AND CONCEPTS COURSE 3**  
**NEW JERSEY**  
 Core Curriculum Content Standards for Mathematics  
 Grade 8

CONTENT STANDARDS	PAGE REFERENCES
<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>	
Building upon knowledge and skills gained in preceding grades, by the end of <b>Grade 8</b> , students will:	
<b>A. Number Sense</b>	
1. Extend understanding of the number system by constructing meanings for the following (unless otherwise noted, all indicators for grade 8 pertain to these sets of numbers as well): <ul style="list-style-type: none"> <li>• Rational numbers</li> <li>• Percents</li> <li>• Exponents</li> <li>• Roots</li> <li>• Absolute values</li> <li>• Numbers represented in scientific notation</li> </ul>	SE: 65 #1, 98-101, 106 #1, 111 #1 <i>Key Concept</i> 62, 104, 116, 206 TWE: B 62, 98
2. Demonstrate a sense of the relative magnitudes of numbers.	SE: 67-70, 75 #37-#40, 80 #48, 100 #2, 106 #3, 109 #21-#25, 111 #25, 127 #5-#6 TWE: B 67 OEA 70
3. Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.	SE: 157 Ex 1-Ex 2, 159 #31-#33, 170-173, 206-209, 216-219, 232-235, 247 #38 TWE: B 156, 210 OEA 173
4. Compare and order numbers of all named types.	SE: 67-70, 75 #37-#40, 80 #48, 100 #2, 106 #3, 109 #21-#25, 111 #25, 127 #5-#6 TWE: B 67 OEA 70
5. Use whole numbers, fractions, decimals, and percents to represent equivalent forms of the same number.	SE: 63-66, 108 #9-#20, 111 #3-#8, 206-209, 210-214, 219 #42-#46, 246 #11-#18, 247 #19-#34, 249 #1 TWE: DI 211
6. Recognize that repeating decimals correspond to fractions and determine their fractional equivalents. <ul style="list-style-type: none"> <li>• <math>\frac{5}{7} = 0.714285714285\dots = 0.714285</math></li> </ul>	SE: 63 Ex 2, 64 Ex 5, 65 #35-#39, 108 #19-#20, 126 Ex 1 <i>Extra Practice Lesson 2-1</i> 619 #14, #17-#18, #22, #24
7. Construct meanings for common irrational numbers, such as $\pi$ (pi) and the square root of 2.	SE: 126 Ex 3, 128 #2, 141 319 <i>Key Concept</i> 125

CONTENT STANDARDS	PAGE REFERENCES
<b>B. Numerical Operations</b>	
1. Use and explain procedures for performing calculations involving addition, subtraction, multiplication, division, and exponentiation 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>	SE: 23-25, 26 #1, 38 #62-#64, 84 #1, 90 #1 TWE: OEA 27, 31, 38, 75, 107
2. Use exponentiation to find whole number powers of numbers.	SE: 99 Ex 2, Ex 4, 100 #27, #29-#34, 107 #46, 110 #54-#55 TWE: DI 99
3. Find square and cube roots of numbers and understand the inverse nature of powers and roots.	SE: 116-119, 120-122, 126 Ex 2-Ex 3, 128 #31-#38, 130 #4-#9, 146 #9-#14, 149 #3-#5 <i>Extra Practice lesson 3-1 622</i>
4. Solve problems involving proportions and percents.	SE: 217 Ex 3, 219 #31-#37, 221 Ex 5, 223 #38-#39, 227 #4, 229 #7, 233 Ex 4, 234 #26-#27, 243 #23-#24, 249 #18-#19
5. Understand and apply the standard algebraic order of operations, including appropriate use of parentheses.	SE: 11-12, 14 #14-#39, 15 #57, 21 #64-#66, 55 #13-#18, 58 #2 TWE: DI 12
<b>C. Estimation</b>	
1. Estimate square and cube roots of numbers.	SE: 120-122, 128 #31-#38, 130 #12-#17, 147 #16-#23, 149 #6-#8 <i>Extra Practice Lesson 3-2 622</i> <i>The Game Zone 131</i> TWE: OEA 122
2. Use equivalent representations of numbers such as fractions, decimals, and percents to facilitate estimation.	SE: 228-231, 235 #33, 240 #38-#41, 248 #45-#50, 249 #10-#11, 600-601 TWE: B 228 OEA 231
3. Recognize the limitations of estimation and assess the amount of error resulting from estimation.	SE: 231 #41-#43, 362 #44, 377 #33-#36 TWE: NS 230
<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>A. Geometric Properties</b>	
1. Understand and apply concepts involving lines, angles, and planes. <ul style="list-style-type: none"> <li>• Complementary and supplementary angles</li> <li>• Vertical angles</li> <li>• Bisectors and perpendicular bisectors</li> <li>• Parallel, perpendicular, and intersecting planes</li> <li>• Intersection of plane with cube, cylinder, cone, and sphere</li> </ul>	SE: 48 #36, 256-260, 265 #36-#39, 270 #24-#27, 306 #8-#11, 309 #3-#5, 331 <i>Hands-on Lab 261, 271</i> TWE: A 259

CONTENT STANDARDS	PAGE REFERENCES
2. Understand and apply the Pythagorean theorem.	SE: 132-136, 137-140, 142-145, 147 #31-#34, 148 #37-#41, 149 #16-#17 TWE: A 145 B 137 DI 138 OEA 136
3. 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> <li>• Sum of measures of interior angles of a polygon</li> <li>• Which polygons can be used alone to generate a tessellation and why</li> </ul>	SE: 272-275, 279-282, 303 #24, 304-305, 307 #19-#20, 309 #8-#10, 311 #13 <i>Hands-on Lab</i> 278 <i>The Game Zone</i> 285 TWE: OEA 275
4. Understand and apply the concept of similarity. <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>	SE: 178-182, 184-187, 191 #21-#25, 197 #29, 199 #21-#23, 200 #24-#27, 201 #11-#12 TWE: B 178, 184 DI 185
5. Use logic and reasoning to make and support conjectures about geometric objects.	SE: 276, 277 #4, #6, 278 TWE: DI 276
<b>B. Transforming Shapes</b>	
1. Understand and apply transformations. <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>	SE: 194-197, 200 #30-#31, 201 #13, 290-294, 296-299, 300-303, 308 #29-#34 TWE: DI 300 OEA 294, 299
2. Use iterative procedures to generate geometric patterns. <ul style="list-style-type: none"> <li>• Fractals (e.g., the Koch Snowflake)</li> <li>• Self-similarity</li> <li>• Construction of initial stages</li> <li>• Patterns in successive stages (e.g., number of triangles in each stage of Sierpinski's Triangle)</li> </ul>	SE: <i>Hands-on Lab</i> 183, 392
<b>C. Coordinate Geometry</b>	
1. Use coordinates in four quadrants to represent geometric concepts.	SE: 143 Ex 1, 144 #4-#21, 194 Ex 1, 195 Ex 2, 197 #17-#20, 291 Ex 2-Ex 3, 299 #16, 302 #5-#8, 529 #24-#25 TWE: DI 195
2. Use a coordinate grid to model and quantify transformations (e.g., translate right 4 units).	SE: 291 Ex 3, 293 #17-#20, 294 #32, 297 Ex 2, 298 #8-#11, 299 #16, 301 Ex 1, 302 #5-#8, 308 #29-#34, 309 #17-#19

CONTENT STANDARDS	PAGE REFERENCES
<b>D. Units of Measurement</b>	
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").	SE: 338 #27-#29, 604-605, 606-607
2. Use approximate equivalents between standard and metric systems to estimate measurements (e.g., 5 kilometers is about 3 miles).	SE: 604-605, 606-607 <i>Measurement Conversions</i> , back cover
3. Recognize that the degree of precision needed in calculations depends on how the results will be used and the instruments used to generate the measurements.	SE: 358-362, 366 #38-#45, 367 #13-#15, 377 #33-#36, 383 #31 <i>Extra Practice Lesson 7-9</i> 635 TWE: B 358 DI 359
4. Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.	SE: 358-362, 654 #14-#15 TWE: DI 359
5. Recognize that all measurements of continuous quantities are approximations.	SE: 358-362 TWE: B 358
6. Solve problems that involve compound measurement units, such as speed (miles per hour), air pressure (pounds per square inch), and population density (persons per square mile).	SE: 40 #14, 97 #14, 157, 158 #30, 154 #37, 325 #8, #13, 492 Ex 4, 587 #43, 651 #2-#3 TWE: DI 157
<b>E. Measuring Geometric Objects</b>	
1. Develop and apply strategies for finding perimeter and area. <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> <li>• Impact of a dilation on the perimeter and area of a 2-dimensional figure</li> </ul>	SE: 314-318, 326-329, 334 #25-#27, 339 #39, 364 #18-#21, 367 #8 TWE: A 329 DI 315 TNT 327
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).	SE: <i>Hands-on Mini Lab</i> 342
3. Develop and apply strategies and formulas for finding the surface area and volume of a three-dimensional figure. <ul style="list-style-type: none"> <li>• Volume - prism, cone, pyramid</li> <li>• Surface area - prism (triangular or rectangular base), pyramid (triangular or rectangular base)</li> <li>• Impact of a dilation on the surface area and volume of a three-dimensional figure</li> </ul>	SE: 342-345, 347-351, 352-355, 365 #24-#25, #27-#28, #30-#31, 366 #33, 367 #9, #11 <i>Spreadsheet Investigation</i> 356-357 TWE: B 347 DI 348 OEA 350

CONTENT STANDARDS	PAGE REFERENCES
4. Use formulas to find the volume and surface area of a sphere.	SE: 345 #25-#29, 355 #21-#24
<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>	
<b>A. Patterns</b>	
1. Recognize, describe, extend, and create patterns involving whole numbers, rational numbers, and integers. <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>• Arithmetic sequences (i.e., sequences generated by repeated addition of a fixed number, positive or negative)</li> <li>• Geometric sequences (i.e., sequences generated by repeated multiplication by a fixed positive ratio, greater than 1 or less than 1)</li> <li>• Generating sequences by using calculators to repeatedly apply a formula</li> </ul>	SE: 512-515, 520 #29-#31, 525 #32, 552 #9-#13, 555 #3-#5, 556 #4 <i>Extra Practice Lesson 11-1</i> 642 <i>Hands-on Lab</i> 516 TWE: B 512 OEA 515
<b>B. Functions and Relationships</b>	
1. Graph functions, and understand and describe their general behavior. <ul style="list-style-type: none"> <li>• Equations involving two variables</li> <li>• Rates of change (informal notion of slope)</li> </ul>	SE: 522-525, 526-529, 534 Ex 3, 553 #20-#24, 555 #8-#9, 658 #5-#7 TWE: B 526 DI 523 OEA 525, 529
2. Recognize and describe the difference between linear and exponential growth, using tables, graphs, and equations.	SE: 560-563, 649 #17 linear growth on: 628 #4-#12 exponential growth on: 100 #41, 101 #42
<b>C. Modeling</b>	
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.	SE: 535 #3, 568 #38 <i>Graphing Calculator Investigation</i> 532, 564 TWE: A 532, 564
2. Use patterns, relations, symbolic algebra, and linear functions to model situations. <ul style="list-style-type: none"> <li>• Using concrete materials (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>	SE: 7 Ex 1, 10 #16, 40 Ex 4, 53 #42-#44, 518 Ex 4-Ex 5, 520 #21-#24, 549 #2 <i>Hands-on Lab</i> 569 <i>Spreadsheet Investigation</i> 245

CONTENT STANDARDS	PAGE REFERENCES
<b>D. Procedures</b>	
1. Use graphing techniques on a number line. <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>	SE: 19 Ex 6, 23 Ex 1, 24 Ex 3-Ex 4 TWE: OEA 27 TT 23
2. Solve simple linear equations informally, graphically, and using formal algebraic methods. <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>	SE: 45-49, 50-53, 56 #46-#58, 57 #23-#28, 58 #9, 66 #51-#54 TWE: A 53 B 45, 50 OEA 49
3. Solve simple linear inequalities.	SE: 496-499, 500-504, 506 #29-#36, 507 #14-#18, 508 #7, 515 #37-#40 <i>Extra Practice Lesson 10-6</i> 642 <i>Extra Practice Lesson 10-7</i> 642 TWE: DI 500
4. Create, evaluate, and simplify algebraic expressions involving variables. <ul style="list-style-type: none"> <li>• Order of operations, including appropriate use of parentheses</li> <li>• Distributive property</li> <li>• Substitution of a number for a variable</li> <li>• Translation of a verbal phrase or sentence into an algebraic expression, equation, or inequality, and vice versa</li> </ul>	SE: 12 Ex 2-Ex 3, 14 #28-#39, #39-#42, 49 #49-#50, 56 #42-#45, 57 #29, 570-573, 577 #44-#47 TWE: B 39 OEA 42
5. Understand and apply the properties of operations, numbers, equations, and inequalities. <ul style="list-style-type: none"> <li>• Additive inverse</li> <li>• Multiplicative inverse</li> <li>• Addition and multiplication properties of equality</li> <li>• Addition and multiplication properties of inequalities</li> </ul>	SE: 45-46, 50-51, 52 #1, 79 #1, 498 #1 <i>Key Concept</i> 25, 76, 496, 500-501 TWE: B 45

CONTENT STANDARDS	PAGE REFERENCES
<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>	
<b>A. Data Analysis</b>	
1. Select and use appropriate representations for sets of data, and measures of central tendency (mean, median, and mode). <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> <li>Finding the median and mean (weighted average) using frequency data.</li> <li>Effect of additional data on measures of central tendency</li> </ul>	SE: 430-433, 435-438, 442-445, 446-449, 459 #13-#21 <i>Graphing Calculator Investigation 425</i> <i>Spreadsheet Investigation 439</i> TWE: B 430, 435 DI 436
2. Make inferences and formulate and evaluate arguments based on displays and analysis of data.	SE: 421 Ex 2, 422 #4, 424 #24, 427 Ex 2-Ex 3, 429 #13, 433 #16, 436 Ex 2-Ex 3, 438 #20, 447 Ex 2, 540 Ex 4-Ex 5
3. Estimate lines of best fit and use them to interpolate within the range of the data.	SE: 540 Ex 4-Ex 5, 541 #6, 542 #17 TWE: DI 540
4. Use surveys and sampling techniques to generate data and draw conclusions about large groups.	SE: 406-409, 412 #46-#49, 413 #20, 424 #26, 429 #16 <i>Extra Practice Lesson 8-7 637</i>
<b>B. Probability</b>	
1. Interpret probabilities as ratios, percents, and decimals.	SE: 374-377, 385 Ex 4, 413 #3-#5
2. Determine probabilities of compound events.	SE: 396-399, 409 #25-#26, 412 #35-#41, 413 #12-#14, 415 #14c TWE: A 399 B 396 DI 398
3. Explore the probabilities of conditional events (e.g., if there are seven marbles in a bag, three red and four green, what is the probability that two marbles picked from the bag, without replacement, are both red).	SE: 397 Ex 3, 398 #17-#22, 399 #29, 403 #26-#27, 412 Ex 5, #41, 413 #12-#14, 415 #15
4. 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>	SE: 376 #4-#9, 383 #17-#20, 396 Ex 1, 398 #9-#14 <i>Graphing Calculator Investigation 404-405</i> TWE: OEA 377
5. Estimate probabilities and make predictions based on experimental and theoretical probabilities.	SE: 400-403, 412 #42-#45, 413 #17-#19 <i>Graphing Calculator Investigation 404-405</i> TWE: A 403 DI 400

CONTENT STANDARDS	PAGE REFERENCES
6. Play and analyze probability-based games, and discuss the concepts of fairness and expected value.	SE: 376 #11-#16, 383 #21 <i>The Game Zone</i> 395 TWE: MT 395
<b>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> <li>Factorial notation</li> <li>Concept of combinations (e.g., number of possible delegations of 3 out of 23 students)</li> </ul>	SE: 380-383, 384-387, 388-391, 399 #30-#33 <i>Hands-on Lab</i> 392-393 TWE: B 380, 384 DI 381, 385 OEA 387
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?).	SE: 123 #3, 124 #4, #10-#11, 125 TWE: ICE 123
3. Apply techniques of systematic listing, counting, and reasoning in a variety of different contexts.	SE: 378-379, 382 #7-#8, 383 #22-#23 TWE: B 378 DI 378 ICE 378
<b>D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms</b>	
1. Use vertex-edge graphs and algorithmic thinking to represent and find solutions to practical problems. <ul style="list-style-type: none"> <li>Finding the shortest network connecting specified sites</li> <li>Finding a minimal route that includes every street (e.g., for trash pick-up)</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> <li>Limitations of computers (e.g., the number of routes for a delivery truck visiting <math>n</math> sites is <math>n!</math>, so finding the shortest circuit by examining all circuits would overwhelm the capacity of any computer, now or in the future, even if <math>n</math> is less than 100)</li> </ul>	This objective can be met during teacher/class discussion.

CONTENT STANDARDS	PAGE REFERENCES
<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>	
<b>Cumulative Progress Indicators</b>	
At each grade level, with respect to content appropriate for that grade level, students will:	
<b>A. Problem Solving</b>	
1. Learn mathematics through problem solving, inquiry, and discovery.	SE: 9 #4-#6, 21 #49-#51, 26 #29-#32, 38 #48, 49 #42-#43, 53 #42-#44, 75 #29, 80 #38-#39, 91 #36-#40, 117 Ex 4
2. Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3). <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>	SE: 9 #4-#6, 21 #49-#51, 26 #29-#32, 38 #48, 49 #42-#43, 53 #42-#44, 75 #29, 80 #38-#39, 91 #36-#40, 117 Ex 4
3. Select and apply a variety of appropriate problem-solving strategies (e.g., try a simpler problem or make a diagram) to solve problems.	SE: 43-44, 96-97, 123-124, 176-177, 226-227, 324-325, 378-379, 418-419, 488-489
4. Pose problems of various types and levels of difficulty.	SE: 21 #58, 31 #45, 49 #45, 80 #40, 159 #34, 223 #40, 234 #2, 240 #33, 270 #19 TWE: OEA 215
5. Monitor their progress and reflect on the process of their problem-solving activity.	SE: 418 #1, 488 #3 TWE: B 418 DI 7, 96, 226, 418
<b>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>	SE: 9 #1, 14 #1, 20 #2, 196 #2, 208 #3, 212 #3 <i>Reading Math</i> 8, 258 <i>Study Skill</i> 215 TWE: OEA 215
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	SE: 9 #1, 14 #1, 20 #2, 196 #2, 208 #3, 212 #3, 562 #2, 567 #1-#3 <i>Study Skill</i> 215 TWE: OEA 215
3. Analyze and evaluate the mathematical thinking and strategies of others.	SE: 30 #2, 41 #2, 74 #3, 84 #3, 118 #4, 121 #3, 135 #3, 168 #3, 186 #2, 212 #3
4. Use the language of mathematics to express mathematical ideas precisely.	SE: 9 #1, 14 #1, 20 #2, 196 #2, 208 #3, 212 #3, 562 #2, 567 #1-#3 <i>Study Skill</i> 215 TWE: OEA 215
<b>C. Connections</b>	
1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	SE: 143, 144 #1, 148 #42-#48, 149 #18-#19, 151 #15 TWE: B 152
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).	SE: 143, 144 #1, 148 #42-#48, 544-547, 551 #29-#32, 554 #39-#44, 555 #18 TWE: B 142, 544 DI 545

<b>CONTENT STANDARDS</b>	<b>PAGE REFERENCES</b>
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	SE: 9 #4-#6, 21 #49-#51, 26 #29-#32, 38 #48, 49 #42-#43, 53 #42-#44, 75 #29, 80 #38-#39, 91 #36-#40, 117 Ex 4
4. Apply mathematics in practical situations and in other disciplines.	SE: 9 #4-#6, 21 #49-#51, 26 #29-#32, 38 #48, 49 #42-#43, 53 #42-#44, 75 #29, 80 #38-#39, 91 #36-#40, 117 Ex 4
5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).	SE: 15 #55, 136 #35, 352 <i>Hands-on Lab</i> 304, 516 <i>Real-Life Math</i> 143
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	SE: 76-77, 88-91, 137-140, 326-329 <i>Spreadsheet Investigation</i> 165
<b>D. Reasoning</b>	
1. Recognize that mathematical facts, procedures, and claims must be justified.	SE: 21 #59-#61, 27 #45, 31 #46-#47, 38 #62-#64, 57 #1, 128 #1, 129 #51, 182 #18-#19, 276
2. Use reasoning to support their mathematical conclusions and problem solutions.	SE: 30 #2, 41 #2, 74 #3, 84 #3, 118 #4, 121 #3, 135 #3, 168 #3, 186 #2, 212 #3
3. Select and use various types of reasoning and methods of proof.	SE: 21 #59-#61, 27 #45, 31 #46-#47, 38 #62-#64, 57 #1, 219 #38, 276
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.	SE: 47 #1, 84 #3, 118 #4, 121 #3, 168 #2, 186 #2, 212 #3, 218 #3, 222 #3, 239 #4
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>	SE: 13 Ex 5, 15 #51-#54, 21 #59-#61, 27 #45, 31 #46-#47, 38 #62-#64, 57 #1, 128 #1, 182 #18-#19, 276
6. Evaluate examples of mathematical reasoning and determine whether they are valid.	SE: 30 #2, 41 #2, 74 #3, 84 #3, 118 #4, 121 #3, 135 #3, 168 #3, 186 #2, 212 #3
<b>E. Representations</b>	
1. Create and use representations to organize, record, and communicate mathematical ideas. <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>	SE: 23 Ex 1, 176-177, 207 Ex 3-Ex 4 <i>Hands-on Lab</i> 278, 468 <i>Hands-on Mini Lab</i> 28, 45, 335, 342, 469
2. Select, apply, and translate among mathematical representations to solve problems.	SE: 176-177, 378-379, 418-419, 479 Ex 5, 481 #19, 520 #26 <i>Hands-on Mini Lab</i> 347, 469 TWE: DI 353 OEA 419
3. Use representations to model and interpret physical, social, and mathematical phenomena.	SE: 176-177, 474 Ex 1 <i>Hands-on Lab</i> 346, 392-393, 482-483, 521 <i>Hands-on Mini Lab</i> 342

CONTENT STANDARDS	PAGE REFERENCES
<b>F. Technology</b>	
1. Use technology to gather, analyze, and communicate mathematical information.	SE: <i>Graphing Calculator Investigation</i> 404-405, 425, 532, 543 <i>Spreadsheet Investigation</i> 165, 245, 439
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.	SE: <i>Graphing Calculator Investigation</i> 425, 543 <i>Spreadsheet Investigation</i> 439
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.	SE: <i>Graphing Calculator Investigation</i> 532, 564 <i>Spreadsheet Investigation</i> 165
4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).	SE: <i>Graphing Calculator Investigation</i> 404-405
5. Use computer software to make and verify conjectures about geometric objects.	SE: <i>Spreadsheet Investigation</i> 356
6. Use computer-based laboratory technology for mathematical applications in the sciences.	SE: <i>WebQuest</i> 371, 457

#### Codes Used for TWE Pages

A	Assess
B	Bellringer
DI	Differentiated Instruction
ICE	In-Class Example
MT	Management Tips
NS	Number Sense
OEA	Open-Ended Assessment
TNT	Tips for New Teachers
TT	Teaching Tip