

**GLENCOE CORRELATION**  
**MATHEMATICS: APPLICATIONS AND CONCEPTS COURSE 2**  
**NEW JERSEY**  
 Core Curriculum Content Standards for Mathematics  
 Grade 7

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 7</b> , students will:	
<b>A. Number Sense</b>	
1. Extend understanding of the number system by constructing meanings for the following <b>(unless otherwise noted, all indicators for grade 7 pertain to these sets of numbers as well)</b> : <ul style="list-style-type: none"> <li>• Rational numbers</li> <li>• Percents</li> <li>• Whole numbers with exponents</li> </ul>	SE: 10-13, 216-219, 220-223, 312-315 TWE: DI 11, 313 A 219
2. Demonstrate a sense of the relative magnitudes of numbers.	SE: 43-45 TWE: B 43
3. Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.	SE: 316-318, 319-321, 323-325 TWE: B 316 A 318 DI 320
4. Compare and order numbers of all named types.	SE: 109-111, 227-231 <i>Study Guide and Review 234 #64-#69</i> TWE: I-CE 110 A 111, 223 DI 228
5. Use whole numbers, fractions, decimals, and percents to represent equivalent forms of the same number.	SE: 210-213, 216-219, 220-223, 312-315 TWE: A 223, 315 DI 228
6. Understand that all fractions can be represented as repeating or terminating decimals.	SE: 210-213, 219 #57-#59 <i>Mid-Chapter Practice Test 214 #13-#15</i> <i>Study Guide and Review 223 #28-#33</i> TWE: DI 313
<b>B. Numerical Operations</b>	
1. Use and explain procedures for performing calculations with integers and all number types named above with: <ul style="list-style-type: none"> <li>• Pencil-and-paper</li> <li>• Mental math</li> <li>• Calculator</li> </ul>	SE: 120-124, 128-131, 134-137, 138-141 <i>Hands-on Lab 118-119, 126-127</i> TWE: DI 129
2. Use exponentiation to find whole number powers of numbers.	SE: 10-13, 17 #56-#59, 43-45 TWE: I-CE 11 A 13, 45

CONTENT STANDARDS	PAGE REFERENCES
3. Understand and apply the standard algebraic order of operations, including appropriate use of parentheses.	SE: 14-17, 21 #50-#53, 27 #51-#53 <i>Mid-Chapter Practice Test</i> 28 #5-#14 TWE: B 14 DI 15 I-CE 15
<b>C. Estimation</b>	
1. Use equivalent representations of numbers such as fractions, decimals, and percents to facilitate estimation.	SE: 240-243, 334-337, 558 TWE: DI 241 I-CE 335
<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 properties of polygons. <ul style="list-style-type: none"> <li>• Quadrilaterals, including squares, rectangles, parallelograms, trapezoids, rhombi</li> <li>• Regular polygons</li> </ul>	SE: 428-431, 434-437, 446-450 <i>The Game Zone</i> 439 TWE: B 434, 446 DI 434
2. 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: 304-308, 440-443 <i>Spreadsheet Investigation</i> 309 <i>Study Guide and Review</i> 464 #21-#22 TWE: B 440 DI 441 A 443
3. Use logic and reasoning to make and support conjectures about geometric objects.	SE: <i>Problem-Solving Strategy</i> 444-445 TWE: B 444 I-CE 444 DI 445
<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: 446-450, 451-454, 456-459 <i>Spreadsheet Investigation</i> 455 <i>Hands-on Lab</i> 460-461 TWE: DI 447 I-CE 452
<b>C. Coordinate Geometry</b>	
1. Use coordinates in four quadrants to represent geometric concepts.	SE: 112-115, 450 #42-#45 <i>The Game Zone</i> 117 TWE: DI 113 I-CE 113
2. Use a coordinate grid to model and quantify transformations (e.g., translate right 4 units).	SE: 451-454, 456-459 <i>Hands-on Lab</i> 460-461 TWE: DI 451, 456

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: 38-41, 267-269 TWE: B 267 A 269
2. Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.	SE: 38-41, 267-269, 273 #26-#29, 542-545 TWE: DI 271 A 273
3. Recognize that all measurements of continuous quantities are approximations.	SE: 273 #27, 542-545 TWE: DI 39, 267 TT 275 A 545
<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> </ul>	SE: 270-273, 275-277, 498-500 TWE: DI 271, 499 A 273, 276 B 498
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).	See <i>Mathematics: Applications and Concepts Course 3</i> . 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
<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>Generating sequences by using calculators to repeatedly apply a formula</li> </ul>	SE: 33 #52-#57, 34-36 <i>Hands-on Lab</i> 37 <i>Study Guide and Review</i> 48 #44-#47 TWE: B 34 DI 35 A 36
<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> </ul>	SE: 177-181 <i>Hands-on Lab</i> 176 TWE: DI 177 A 181

CONTENT STANDARDS	PAGE REFERENCES
<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: 177-181, 182-185 <i>Hands-on Lab</i> 176 <i>Study Guide and Review</i> 188, #54-#62 TWE: A 181 B 182
2. Use patterns, relations, symbolic algebra, and linear functions to model situations. <ul style="list-style-type: none"> <li>• Using manipulatives, tables, graphs, verbal rules, algebraic expressions/equations/inequalities</li> <li>• Growth situations, such as population growth and compound interest, using recursive (e.g., NOW-NEXT) formulas (cf. science standard 5.5 and social studies standard 6.6)</li> </ul>	SE: 159 #37-#39, 163 #38-#41, 172-175, 182-185 <i>Problem-Solving Strategy</i> 164-165 <i>Practice Test</i> 189 #16-#19
<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: 106-108, 120-124, 128-131 TWE: DI 106 B 128 TNT 129 A 130
2. Solve simple linear equations informally and graphically. <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: 166-169, 177-181 <i>Hands-on Lab</i> 176 TWE: I-CE 178-179 DI 177 A 181
3. 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>• Substitution of a number for a variable</li> </ul>	SE: 18-21, 27 #50 <i>Mid-Chapter Practice Test</i> 28 #11-#14 <i>The Game Zone</i> 29 TWE: I-CE 19 A 21
4. 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> </ul>	SE: 156-159, 160-163, 166-169, 172-175 <i>Hands-on Lab</i> 154-155 <i>Problem-Solving Strategy</i> 164-165 TWE: A 159 B 160

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> </ul>	SE: 64-68, 69-72, 76-79, 80-83 <i>Hands-on Lab 73</i> <i>The Game Zone 75</i> <i>Graphing Calculator Investigation 84</i> <i>Spreadsheet Investigation 90-91</i> TWE: DI 60
2. Make inferences and formulate and evaluate arguments based on displays and analysis of data.	SE: 60-63, 92-95 TWE: B 60, 92 A 63, 95
<b>B. Probability</b>	
1. Interpret probabilities as ratios, percents, and decimals.	SE: 370-373, 393-396, 398-401
2. Model situations involving probability with simulations (using spinners, dice, calculators and computers) and theoretical models. <ul style="list-style-type: none"> <li>• Frequency, relative frequency</li> </ul>	SE: 393-396, 398-401 TWE: I-CE 394 DI 399 A 401
3. Estimate probabilities and make predictions based on experimental and theoretical probabilities.	SE: 370-373, 393-396 <i>Hands-on Lab 397</i> TWE: A 395 I-CE 394
4. Play and analyze probability-based games, and discuss the concepts of fairness and expected value.	SE: 398-401 <i>Mid-Chapter Practice Test 384 #7-#10</i> <i>The Game Zone 385</i> <i>Study Guide and Review 404 #36-#43</i>
<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> </ul>	SE: 381-383, 387-390 <i>Mid-Chapter Practice Test 384 #11-#14</i> <i>Hands-on Lab 386</i> TWE: DI 381, 388 A 383
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: 378-380, 400 #10 TWE: B 203

CONTENT STANDARDS	PAGE REFERENCES
3. Apply techniques of systematic listing, counting, and reasoning in a variety of different contexts.	SE: 374-377, 378-380 <i>Problem-Solving Strategy</i> 201-202 TWE: B 374 A 376
<b>D. Discrete Mathematics–Vertex-Edge Graphs and Algorithms</b>	
1. Use vertex-edge graphs 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 the shortest route on a map from one site to another</li> <li>Finding the shortest circuit on a map that makes a tour of specified sites</li> </ul>	SE: 112-115, 453 #12
<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: <i>Problem-Solving Strategy</i> 22-23, 132-133, 164-165, 252-253, 338-339, 444-445, 496-497
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: 6-9 <i>Problem-Solving Strategy</i> 22-23 <i>Hands-on Lab</i> 196 TWE: A 169, 206 B 220
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: <i>Problem-Solving Strategy</i> 58-59, 132-133, 165-165, 302-303, 444-445, 496-497
4. Pose problems of various types and levels of difficulty.	SE: <i>Problem-Solving Strategy</i> 22-23, 132-133, 164-165 <i>Hands-on Lab</i> 176 TWE: A 175, 185
5. Monitor their progress and reflect on the process of their problem-solving activity.	SE: <i>Problem-Solving Strategy</i> 391-392 TWE: DI 22, 201, 391 A 23, 202
<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: <i>Hands-on Lab</i> 397 TWE: A 9, 17, 159, 202 B 216
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	TWE: A 9, 23, 133, 165 DI 25 TNT 204 PS 405

CONTENT STANDARDS	PAGE REFERENCES
3. Analyze and evaluate the mathematical thinking and strategies of others.	TWE: TNT 167 DI 211, 335, 434, 525
4. Use the language of mathematics to express mathematical ideas precisely.	SE: <i>Write Math</i> 417, 427 TWE: A 9, 133, 159, 209
<b>C. Connections</b>	
1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	SE: 30-33 <i>Problem-Solving Strategy</i> 132-133 TWE: B 160
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: 292-295 <i>Hands-on Lab</i> 37, 296 TWE: B 160 TT 166
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	SE: <i>Interdisciplinary Project</i> 3, 103, 193, 285 <i>When Am I Ever Going To Use This?</i> 288 TWE: DI 35, 109, 289
4. Apply mathematics in practical situations and in other disciplines.	SE: <i>Interdisciplinary Project</i> 3, 285 TWE: DI 263, 271 MA 3 MS 3, 103
5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).	SE: 31 Ex #3, 213 #44-#45, 516 #17-#20 TWE: B 38 A 41 PS 465
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	SE: 312-315 <i>Hands-on Lab</i> 301 TWE: A 315 DI 324
<b>D. Reasoning</b>	
1. Recognize that mathematical facts, procedures, and claims must be justified.	SE: <i>Problem-Solving Strategy</i> 252 #3 TWE: A 261, 269, 450
2. Use reasoning to support their mathematical conclusions and problem solutions.	SE: <i>Problem-Solving Strategy</i> 338-339, 444-445 TWE: A 269, 339 I-CE 338
3. Select and use various types of reasoning and methods of proof.	SE: <i>Problem-Solving Strategy</i> 338-339, 444-445 TWE: DI 445
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.	SE: <i>Problem-Solving Strategy</i> 338-339 TWE: I-CE 338
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: <i>Writing Math</i> 119, 322, 433, 478 TWE: A 41 B 160
6. Evaluate examples of mathematical reasoning and determine whether they are valid.	SE: <i>Hands-on Lab</i> 37 <i>Problem-Solving Strategy</i> 338-339 TWE: B 60 A 339, 445

CONTENT STANDARDS	PAGE REFERENCES
<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: <i>Hands-on Lab</i> 118-119, 126-127 TWE: A 21, 33 DI 121, 157 B 128
2. Select, apply, and translate among mathematical representations to solve problems.	SE: 203 Ex #1 <i>Hands-on Lab</i> 154-155 <i>Hands-on Mini-Lab</i> 160 TWE: DI 157 A 219
3. Use representations to model and interpret physical, social, and mathematical phenomena.	SE: 60 Ex #1, 286 TWE: A 21, 169 DI 25
<b>F. Technology</b>	
1. Use technology to gather, analyze, and communicate mathematical information.	SE: 62 #7 <i>Graphing Calculator Investigation</i> 84 <i>Spreadsheet Investigation</i> 90-91, 309-361
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.	SE: <i>Graphing Calculator Investigation</i> 84 <i>Spreadsheet Investigation</i> 90-91, 309-361
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.	See <i>Mathematics: Applications and Concepts Course 3</i> . 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: 210-211 Ex #1-#2, 476 Ex #2 <i>Study Tip</i> 11, 44, 120 TWE: DI 211 A 213
5. Use computer software to make and verify conjectures about geometric objects.	SE: <i>Spreadsheet Investigation</i> 455, 523
6. Use computer-based laboratory technology for mathematical applications in the sciences.	SE: <i>Interdisciplinary Project</i> 3, 193, 285

## Codes Used for TWE Pages

A	Assess
B	Bellringer
DI	Daily Intervention
I-CE	In-Class Examples
MA	Math and Art
MS	Math and Science
PS	Portfolio Suggestion
TNT	Tips for New Teachers
TT	Teaching Tip