

**New Jersey Core Curriculum Content Standards
for Mathematics, Grade 7, Correlated to
Glencoe Mathematics: Applications and Concepts, Course 2**

Lessons in which the Cumulative Progress Indicators are a primary focus are indicated in **bold**.

Strands and Cumulative Progress Indicators	Student Edition Lesson(s)
STANDARD 4.1: NUMBER AND NUMERICAL OPERATIONS	
A. Number Sense	
4.1.7A1 Extend understanding of the number system by constructing meanings for the following (unless otherwise noted, all indicators for grade 7 pertain to these sets of numbers as well): <ul style="list-style-type: none"> • Rational numbers • Percents • Whole numbers with exponents 	1-2, 5-5, 5-6, 5-8, 7-5, 7-6
4.1.7A2 Demonstrate a sense of the relative magnitudes of numbers.	1-9
4.1.7A3 Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.	5-5, 5-6, 7-1, 7-2, 7-3, 7-3b, 7-4, 7-5, 7-6, 7-7, 7-8, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 10-6, 12-4b
4.1.7A4 Compare and order numbers of all named types.	1-2, 1-9, 3-2, 5-6, 5-8
4.1.7A5 Use whole numbers, fractions, decimals, and percents to represent equivalent forms of the same number.	5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 7-5, 7-6, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6
4.1.7A6 Understand that all fractions can be represented as repeating or terminating decimals.	5-4
B. Numerical Operations	
4.1.7B1 Use and explain procedures for performing calculations with integers and all number types named above with: <ul style="list-style-type: none"> • Pencil-and-paper • Mental math • Calculator 	1-8, 1-9, 3-4, 3-5, 3-6, 3-7, 5-4, 6-1, 6-2, 6-3, 6-4, 6-9, 7-5, 7-7, 7-8, 8-1, 8-2, 8-4, 9-4, 11-1, 11-2, 11-6
4.1.7B2 Use exponentiation to find whole number powers of numbers.	1-2
4.1.7B3 Understand and apply the standard algebraic order of operations, including appropriate use of parentheses.	1-3, 1-4
C. Estimation	
4.1.7C1 Use equivalent representations of numbers such as fractions, decimals, and percents to facilitate estimation.	8-1, 8-1b
STRAND 4.2: GEOMETRY AND MEASUREMENT	
A. Geometric Properties	
4.2.7A1 Understand and apply properties of polygons. <ul style="list-style-type: none"> • Quadrilaterals, including squares, rectangles, parallelograms, trapezoids, rhombi • Regular polygons 	10-5, 10-7
4.2.7A2 Understand and apply the concept of similarity. <ul style="list-style-type: none"> • Using proportions to find missing measures • Scale drawings • Models of 3D objects 	7-4, 10-6, 12-1a, 12-2b

4.2.7A3	Use logic and reasoning to make and support conjectures about geometric objects.	10-3, 10-4, 10-6, 10-7a
B. Transforming Shapes		
4.2.7B1	Understand and apply transformations. <ul style="list-style-type: none"> Finding the image, given the pre-image, and vice-versa Sequence of transformations needed to map one figure onto another Reflections, rotations, and translations result in images congruent to the pre-image Dilations (stretching/shrinking) result in images similar to the pre-image 	10-8, 10-8b, 10-9, 10-9b
C. Coordinate Geometry		
4.2.7C1	Use coordinates in four quadrants to represent geometric concepts.	3-3, 10-8, 10-8b, 10-9, 10-9b
4.2.7C2	Use a coordinate grid to model and quantify transformations (e.g., translate right 4 units).	10-8, 10-8b, 10-9, 10-9b
D. Units of Measurement		
4.2.7D1	Solve problems requiring calculations that involve different units of measurement within a measurement system (e.g., 4'3" plus 7'10" equals 12'1").	See Course 1, Lesson 12-6.
4.2.7D2	Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.	beyond the scope of this course
4.2.7D3	Recognize that all measurements of continuous quantities are approximations.	12-6
E. Measuring Geometric Objects		
4.2.7E1	Develop and apply strategies for finding perimeter and area. <ul style="list-style-type: none"> Geometric figures made by combining triangles, rectangles and circles or parts of circles Estimation of area using grids of various sizes 	11-4, 11-5a, 11-5, 11-7 , 11-8
4.2.7E2	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 Course 3, Lesson 7-6.
STRAND 4.3: PATTERNS AND ALGEBRA		
A. Patterns		
4.3.7A1	Recognize, describe, extend, and create patterns involving whole numbers, rational numbers, and integers. <ul style="list-style-type: none"> Descriptions using tables, verbal and symbolic rules, graphs, simple equations or expressions Finite and infinite sequences Generating sequences by using calculators to repeatedly apply a formula 	1-4, 1-5, 1-7, 1-7b, 4-1, 4-6a, 4-6, 4-7
B. Functions and Relationships		
4.3.7B1	Graph functions, and understand and describe their general behavior. <ul style="list-style-type: none"> Equations involving two variables 	4-6a, 4-6, 4-7
C. Modeling		
4.3.7C1	Analyze functional relationships to explain how a change in one quantity can result in a change in another, using pictures, graphs, charts, and equations.	4-7 ; See also Course 3, Lessons 11-5a, 12-2a
4.3.7C1	Use patterns, relations, symbolic algebra, and linear functions to model situations.	

<ul style="list-style-type: none"> Using manipulatives, tables, graphs, verbal rules, algebraic expressions/equations/inequalities 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) 	1-4, 1-5, 4-1, 4-2a, 4-2, 4-3, 4-4, 4-5, 4-6, 6-5, 6-9a, 6-9, 7-3, 7-4, 7-8, 8-2, 8-3, 8-5, 8-6, 11-4, 11-5a, 11-5, 11-6, 12-2, 12-3, 12-4, 12-5
D. Procedures	
4.3.7D1 Use graphing techniques on a number line. <ul style="list-style-type: none"> Absolute value Arithmetic operations represented by vectors (arrows) (e.g., “$-3 + 6$” is “left 3, right 6”) 	3-1, 3-4 , 3-5, 3-6
4.3.7D2 Solve simple linear equations informally and graphically. <ul style="list-style-type: none"> Multi-step, integer coefficients only (although answers may not be integers) Using paper-and-pencil, calculators, graphing calculators, spreadsheets, and other technology 	4-2, 4-3, 4-4, 6-5 , 8-6b; See also Calculator and Spreadsheet Masters, pages 25-27
4.3.7D3 Create, evaluate, and simplify algebraic expressions involving variables. <ul style="list-style-type: none"> Order of operations, including appropriate use of parentheses Substitution of a number for a variable 	1-3, 1-4 ; covered throughout the text
4.3.7D4 Understand and apply the properties of operations, numbers, equations, and inequalities. <ul style="list-style-type: none"> Additive inverse Multiplicative inverse 	3-4, 4-2, 6-5
STRAND 4.4: DATA ANALYSIS, PROBABILITY, AND DISCRETE MATHEMATICS	
A. Data Analysis	
4.4.7A1 Select and use appropriate representations for sets of data, and measures of central tendency (mean, median, and mode). <ul style="list-style-type: none"> Type of display most appropriate for given data Box-and-whisker plot, upper quartile, lower quartile Scatter plot Calculators and computer used to record and process information 	2-1, 2-2a, 2-2, 2-3, 2-4b, 2-5, 2-6, 2-6b, 2-7b , 2-7, 2-8
4.4.7A2 Make inferences and formulate and evaluate arguments based on displays and analysis of data.	2-1, 2-2a, 2-2, 2-3, 2-4, 2-4b, 2-5, 2-6, 2-6b, 2-7, 2-8
B. Probability	
4.4.7B1 Interpret probabilities as ratios, percents, and decimals.	9-1 , 9-2, 9-6, 9-6b
4.4.7B2 Model situations involving probability with simulations (using spinners, dice, calculators and computers) and theoretical models. <ul style="list-style-type: none"> Frequency, relative frequency 	2-1; 9-6a, 9-6b ; See also Course 1, Lesson 5-2
4.4.7B3 Estimate probabilities and make predictions based on experimental and theoretical probabilities.	9-6a, 9-6
4.4.7B4 Play and analyze probability-based games, and discuss the concepts of fairness and expected value.	9-2, 9-6, page 385
C. Discrete Mathematics—Systematic Listing and Counting	
4.4.7C1 Apply the multiplication principle of counting. <ul style="list-style-type: none"> 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) 	9-4

4.4.7C2	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?).	See Course 3, Lesson 3-3a
4.4.7C3	Apply techniques of systematic listing, counting, and reasoning in a variety of different contexts.	9-2, 9-3, 9-4, 9-5a, 9-5, 9-6a
D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms		
4.4.7D1	Use vertex-edge graphs to represent and find solutions to practical problems. <ul style="list-style-type: none"> • Finding the shortest network connecting specified sites • Finding the shortest route on a map from one site to another • Finding the shortest circuit on a map that makes a tour of specified sites 	beyond the scope of this course
STRAND 4.5: MATHEMATICAL PROCESSES		
A. Problem Solving		
4.5.7A1	Learn mathematics through problem solving, inquiry, and discovery.	covered throughout the text
4.5.7A2	Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3). <ul style="list-style-type: none"> • Open-ended problem • Non-routine problems • Problems with multiple solutions • Problems that can be solved in several ways 	covered throughout the text
4.5.7A3	Select and apply a variety of appropriate problem-solving strategies (e.g., “try a simpler problem” or “make a diagram”) to solve problems.	1-1, 1-5a, 2-2a, 3-6a, 4-4a, 5-2a, 6-3b, 7-4a, 8-1b, 9-6a, 10-7a, 11-7a, 12-1b
4.5.7A4	Pose problems of various types and levels of difficulty.	1-4, 1-6, 3-7, 4-6, 5-8, 7-1, 7-3, 9-5, 10-3, 10-4, 12-3, 12-4
4.5.7A5	Monitor their progress and reflect on the process of their problem solving activity.	1-7b, 2-4b, 3-4a, 3-5a, 4-2a, 5-1a, 6-9a, 7-2b, 7-8a, 9-5a, 9-6b, 10-9b, 11-3a, 11-5a, 12-1a, 12-4a, 12-4b
B. Communication		
4.5.7B1	Use communication to organize and clarify their mathematical thinking. <ul style="list-style-type: none"> • Reading and writing • Discussion, listening, and questioning 	1-5a, 1-7b, 2-2a, 2-4b, 3-4a, 3-5a, 3-6a, 4-2a, 4-4a, 4-6a, 5-1a, 5-2a, 6-3b, 6-9a, 7-2b, 7-3b, 7-4a, 7-8a, 8-1b, 8-3a, 9-5a, 9-6a, 9-6b, 10-1a, 10-1b, 10-3b, 10-4b, 10-7a, 10-9b, 11-3a, 11-5a, 11-7a, 12-1a, 12-1b, 12-4a, 12-4b
4.5.7B2	Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	covered throughout the text
4.5.7B3	Analyze and evaluate the mathematical thinking and strategies of others.	1-3, 1-5, 1-8, 2-3, 2-4, 2-5, 3-4, 3-5, 4-1, 4-3, 4-4, 4-5, 5-2, 5-3, 5-6, 6-2, 6-3, 6-9, 7-1, 7-2, 8-1, 8-4, 9-5, 9-7, 10-5, 11-3, 11-6, 12-2, 12-5

4.5.7B4	Use the language of mathematics to express mathematical ideas precisely.	covered throughout the text
C. Connections		
4.5.7C1	Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	1-1, 1-4, 1-7, 1-7b, 3-6a, 4-7, 10-7
4.5.7C2	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).	covered throughout the text
4.5.7C3	Recognize that mathematics is used in a variety of contexts outside of mathematics.	covered throughout the text
4.5.7C4	Apply mathematics in practical situations and in other disciplines.	covered throughout the text
4.5.7C5	Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).	covered in the Chapter Resource Masters
4.5.7C6	Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	covered throughout the text
D. Reasoning		
4.5.7D1	Recognize that mathematical facts, procedures, and claims must be justified.	covered throughout the text
4.5.7D2	Use reasoning to support their mathematical conclusions and problem solutions.	covered throughout the text
4.5.7D3	Select and use various types of reasoning and methods of proof.	1-7b, 2-4b, 3-4a, 3-5a, 4-2a, 5-1a, 6-9a, 7-2b, 7-8a, 9-5a, 9-6b, 10-7a , 10-9b, 11-3a, 11-5a, 12-1a, 12-4a, 12-4b
4.5.7D4	Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.	8-1b
4.5.7D5	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. 	1-7, 1-7b3-4a, 3-5a, 4-2a, 4-7, 5-1a, 6-2, 6-3, 6-4, 7-2b, 7-3, 7-8a, 10-4, 10-4b, 10-6, 10-9b, 11-3a, 11-4, 11-5a; See Course 3, Lesson 1-2
4.5.7D6	Evaluate examples of mathematical reasoning and determine whether they are valid.	1-3, 1-5, 1-8, 2-3, 2-4, 2-5, 3-4, 3-5, 4-1, 4-3, 4-4, 4-5, 5-2, 5-3, 5-6, 6-2, 6-3, 6-9, 7-1, 7-2, 8-1, 8-4, 9-5, 9-7, 10-5, 11-3, 11-6, 12-2, 12-5
E. Representations		
4.5.7E1	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) 	1-7b, 2-2a, 2-2, 2-3, 2-4, 2-4b, 2-5, 2-6, 2-7, 2-8, 3-4a, 3-5a, 3-6, 3-7, 4-2a, 4-2, 4-3, 4-4, 4-6a, 4-6, 4-7, 6-8, 6-9a, 6-9, 7-3b, 8-6, 11-3a, 11-3, 11-4, 11-5a, 11-5, 11-6, 12-2, 12-3, 12-4, 12-5
4.5.7E2	Select, apply, and translate among mathematical representations to solve problems.	covered throughout the text

F. Technology		
4.5.7F1	Use technology to gather, analyze, and communicate mathematical information.	2-6b, 2-7b, 7-4b, 8-6b, 10-8b, 12-2b; See also Calculator and Spreadsheet Masters
4.5.7F2	Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.	2-6b, 2-7b, 7-4b, 8-6b, 10-8b, 12-2b ; See also Calculator and Spreadsheet Masters
4.5.7F3	Use graphing calculators and computer software to investigate properties of functions and their graphs.	See Course 3, Lessons 11-5a and 12-2a
4.5.7F4	Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).	1-2, 1-9, 3-4, 5-4, 6-9, 7-5, 9-4, 11-1, 11-2, 11-6
4.5.7F5	Use computer software to make and verify conjectures about geometric objects.	7-4b, 10-8b, 12-2b
4.5.7F6	Use computer-based laboratory technology for mathematical applications in the sciences.	covered in Course 2, Course 3 Science and Mathematics Lab Manual on the Internet (msmath2.net and msmath3.net)