



## 7th Grade Mathematics Curriculum Framework

	Mathematics Curriculum Framework	I CAN Learn® Lesson Number	I CAN Learn® Lesson Title
<b>Number and Numerical Operations</b>			
4.1.7.A	Number Sense		
	1. 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):		
	· Rational numbers	MM1-602	Comparing and Ordering Rational Numbers
	· Percents	MPA-081	Converting Fractions, Decimals, and Percents I
		MPA-082	Converting Fractions, Decimals, and Percents II
	· Whole numbers with exponents	MPA-013	Using Powers and Exponents in Expressions
	2. Demonstrate a sense of the relative magnitudes of numbers.	MPA-001	Identifying, Comparing, and Ordering Whole Numbers Through Billions
		MPA-043	Reading and Writing Integers
		MPA-015	Identifying the Place Value of Decimals Through Thousandths
		MPA-016	Comparing and Ordering Decimals
	3. Understand and use ratios, proportions, and percents (including percents greater than 100 and less than 1) in a variety of situations.	MPA-079	Unit rates
		MPA-080	Solving Proportions
		MPA-081	Converting Fractions, Decimals, and Percents I
		MPA-082	Converting Fractions, Decimals, and Percents II
	4. Compare and order numbers of all named types.	MM1-602	Comparing and Ordering Rational Numbers
		MPA-016	Comparing and Ordering Decimals
		MPA-031	Comparing and Ordering Fractions and Decimals
		MPA-045	Comparing and Ordering Integers
	5. Use whole numbers, fractions, decimals, and percents to represent equivalent forms of the same number.	MPA-029	Converting Fractions and Decimals
		MPA-032	Converting Improper Fractions and Mixed Numbers
		MPA-081	Converting Fractions, Decimals, and Percents I
		MPA-082	Converting Fractions, Decimals, and Percents II
	6. Understand that all fractions can be represented as repeating or terminating decimals.	MPA-029	Converting Fractions and Decimals
4.1.7.B	B. Numerical Operations		
	1. Use and explain procedures for performing calculations with integers and all number types named above with:	MPA-047	Adding Integers with Like Signs
	· Pencil-and-paper	MPA-048	Adding Integers with Unlike Signs
	· Mental math	MPA-050	Subtracting Integers with Unlike Signs
	· Calculator	MPA-051	Multiplying Integers with Like and Unlike Signs
		MPA-052	Dividing Integers with Like and Unlike Signs

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		MPA-053	Adding, Subtracting, Multiplying, and Dividing Integers
		MPA-117	Modeling Integer Arithmetic Using Cups and Counters
	2. Use exponentiation to find whole number powers of numbers.	MPA-013	Using Powers and Exponents in Expressions
	3. Understand and apply the standard algebraic order of operations, including appropriate use of parentheses.	MPA-008	Order of Operations
4.1.7.C	C. Estimation		
	1. Use equivalent representations of numbers such as fractions, decimals, and percents to facilitate estimation	MPA-017	Rounding Decimals and Estimating Computations Using Decimals
		MPA-023	Rounding Quotients Involving Decimals
		MPA-033	Estimating Computations with Fractions and Mixed Numbers
<b>Geometry and Measurement</b>			
4.2.7.A	Geometric Properties		
	1. Understand and apply properties of polygons.		
	· Quadrilaterals, including squares, rectangles, parallelograms, trapezoids, rhombi	MPA-058	Identifying Polygons
	· Regular polygons	MPA-060	Determining Which Figures Tessellate
	2. Understand and apply the concept of similarity.		
	· Using proportions to find missing measures	MPA-121	Identifying Similar and Congruent Polygons Using Proportions
	· Scale drawings	MPA-110	Solving Problems Using Proportions, Scale Drawings, Models, and Maps
	· Models of 3D objects	MPA-111	Comparing Perimeters, Areas, and Volumes of Similar Geometric Figures and Solids
	3. Use logic and reasoning to make and support conjectures about geometric objects.	Throughout	
4.2.7.B	B. Transforming Shapes		
	1. Understand and apply transformations.	MPA-108	Graphing Translations and Reflections on the Coordinate Plane
	· Finding the image, given the pre-image, and vice-versa	MPA-108	Graphing Translations and Reflections on the Coordinate Plane
	· Sequence of transformations needed to map one figure onto another	MPA-108	Graphing Translations and Reflections on the Coordinate Plane
	· Reflections, rotations, and translations result in images congruent to the pre-image	MPA-180	Examining Line and Rotational Symmetry
	· Dilations (stretching/shrinking) result in images similar to the pre-image	MPA-120	Applying Dilations in the Coordinate Plane
4.2.7.C	C. Coordinate Geometry		
	1. Use coordinates in four quadrants to represent geometric concepts.	MPA-160	Plotting Polygons and Finding the Area
	2. Use a coordinate grid to model and quantify transformations (e.g., translate right 4 units).	MPA-108	Graphing Translations and Reflections on the Coordinate Plane
4.2.7.D	D. Units of Measurement		
	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").	MPA-062	Converting Units in Customary System
	2. Select and use appropriate units and tools to measure quantities to the degree of precision needed in a particular problem-solving situation.	MPA-134	Calculating with Precision, Accuracy, and Significant Digits
	3. Recognize that all measurements of continuous quantities are approximations.	MPA-133	Distinguishing Between Exact and Approximate Answers
4.2.7.E	E. Measuring Geometric Objects		
	1. Develop and apply strategies for finding perimeter and area.	MPA-055	Finding the Perimeter of a Figure
	· Geometric figures made by combining triangles, rectangles and circles or parts of circles	MPA-068	Finding the Area of Irregular Figures
	· Estimation of area using grids of various sizes	MPA-160	Plotting Polygons and Finding the Area
	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).	MPA-115	Finding the Volumes of Prisms, Cylinders, Pyramids, and Cones Using Models
<b>Patterns and Algebra</b>			

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4.3.7.A	Patterns		
	1. Recognize, describe, extend, and create patterns involving whole numbers, rational numbers, and integers.		
	· Descriptions using tables, verbal and symbolic rules, graphs, simple equations or expressions	MPA-270	Generating Algebraic Expressions from Patterns of Models
	· Finite and infinite sequences	HA1-447	Identifying Number Patterns
	· Generating sequences by using calculators to repeatedly apply a formula	HA1-448	Finding the nth Term of a Pattern
4.3.7.B	B. Functions and Relationships		
	1. Graph functions, and understand and describe their general behavior.	MPA-142	Solving Problems With Linear Functions and Direct Variation
		MPA-150	Identifying and Graphing Linear and Nonlinear Functions
	· Equations involving two variables	HA1-375	Identifying Solutions of Equations in Two Variables
4.3.7.C	C. Modeling		
	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.	MPA-142	Solving Problems With Linear Functions and Direct Variation
		HA1-402	Translating Among Multiple Representations of Functions
	2. Use patterns, relations, symbolic algebra, and linear functions to model situations.		
	· Using manipulatives, tables, graphs, verbal rules, algebraic expressions/equations/inequalities	MPA-118	Modeling Integer Arithmetic Using Algebra Tiles
		MPA-102	Graphing Equations by Plotting Points
		MPA-041	Writing Simple Algebraic Expressions from Phrases
	· 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)	MPA-150	Identifying and Graphing Linear and Nonlinear Functions
		MPA-128	Solving Real-World Problems Involving Simple and Compound Interest
4.3.7.D	D. Procedures		
	1. Use graphing techniques on a number line.		
	· Absolute value	MPA-044	Finding Opposite and Absolute Values of Integers
	· Arithmetic operations represented by vectors (arrows) (e.g., "-3 + 6" is "left 3, right 6")	MPA-048	Adding Integers with Unlike Signs (using a number line)
	2. Solve simple linear equations informally and graphically.		
	· Multi-step, integer coefficients only (although answers may not be integers)	MPA-054	Solving One-Step Equations with Integers Using all Four Operations
		MPA-100	Solving Two-Step Equations
		MPA-101	Solving Equations by Combining Like Terms
	· Using paper-and-pencil, calculators, graphing calculators, spreadsheets, and other technology	Throughout	
	3. Create, evaluate, and simplify algebraic expressions involving variables.		
	· Order of operations, including appropriate use of parentheses	MPA-008	Order of Operations
	· Substitution of a number for a variable	MPA-014	Evaluating Expressions for Given Variables
	4. Understand and apply the properties of operations, numbers, equations, and inequalities.		
	· Additive inverse	MPA-117	Modeling Integer Arithmetic Using Cups and Counters
		MPA-053	Adding, Subtracting, Multiplying, and Dividing Integers
		MPA-054	Solving One-Step Equations with Integers Using all Four Operations
		MPA-100	Solving Two-Step Equations
		MPA-101	Solving Equations by Combining Like Terms
		MPA-109	Solving and Graphing Linear Inequalities on a Number Line
	· Multiplicative inverse	MPA-051	Multiplying Integers with Like and Unlike Signs

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		MPA-052	Dividing Integers with Like and Unlike Signs
		MPA-100	Solving Two-Step Equations
		MPA-101	Solving Equations by Combining Like Terms
		MPA-109	Solving and Graphing Linear Inequalities on a Number Line
<b>Data Analysis, Probability, and Discrete Mathematics</b>			
4.4.7.A	Data Analysis (or Statistics)		
	1. Select and use appropriate representations for sets of data, and measures of central tendency (mean, median, and mode).	MPA-095	Find the Mean, Median, and Mode
	· Type of display most appropriate for given data	MPA-129	Choosing Appropriate Scales and Intervals for Data
		MPA-098	Making Predictions from Graphs and Choosing the Correct Graph
	· Box-and-whisker plot, upper quartile, lower quartile	MPA-097	Constructing Box-and-Whisker Plots
	· Scatter plot	MPA-132	Interpreting and Creating Scatterplots
	· Calculators and computer used to record and process information	Throughout	
	2. Make inferences and formulate and evaluate arguments based on displays and analysis of data.	MPA-098	Making Predictions from Graphs and Choosing the Correct Graph
		MPA-099	Recognizing Misleading Statistics and Graphs
4.4.7.B	B. Probability		
	1. Interpret probabilities as ratios, percents, and decimals.		
	2. Model situations involving probability with simulations (using spinners, dice, calculators and computers) and theoretical models.	MPA-090	Finding the Probability of Simple Real-Life Events
	· Frequency, relative frequency	MPA-112	Constructing Sample Spaces for Compound Events (Dependent and Independent)
	3. Estimate probabilities and make predictions based on experimental and theoretical probabilities.	MM1-235	Finding Experimental Probability
	4. Play and analyze probability-based games, and discuss the concepts of fairness and expected value.	Journal	
4.4.7.C	C. Discrete Mathematics—Systematic Listing and Counting		
	1. Apply the multiplication principle of counting.	MPA-091	Finding the Number of Combinations of a Set of Objects
	· 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)	MPA-091	Finding the Number of Combinations of a Set of Objects
	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?).	Grade level content under review	
	3. Apply techniques of systematic listing, counting, and reasoning in a variety of different contexts.	MPA-089	Using Tree Diagrams
4.4.7.D	D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms		
	1. Use vertex-edge graphs to represent and find solutions to practical problems.	*Activity	
	· Finding the shortest network connecting specified sites	*Activity	
	· Finding the shortest route on a map from one site to another	*Activity	
	· Finding the shortest circuit on a map that makes a tour of specified sites	*Activity	

\*Activities include Problem Sets of the Day and Journal Questions.

MM1-Fundamentals of Mathematics

MPA- Pre-Algebra

HA1-Algebra 1

HGM - Geometry (New course in development)

Note: Standards were taken from the New Jersey 7<sup>th</sup> Grade Mathematics Content Standards document adopted by the New Jersey State Board of Education in 1/9/2008.