



8th Grade Mathematics Curriculum Framework

	Mathematics Curriculum Framework	I CAN Learn® Lesson Number	I CAN Learn® Lesson Title
NUMBER AND OPERATIONS			
M(N&O)–8–1	Demonstrates conceptual understanding of rational numbers with respect to absolute values, perfect square and cube roots, and percents as a way of describing change (percent increase and decrease) using explanations, models, or other representations. (Local)	HA1-030	Using Opposites and Absolute Values
		HA1-480	Finding the Square Roots of Rational Numbers
		HA1-492	Simplifying Square and Cube Roots
		MPA-087	Finding Percent Increase and Decrease
M(N&O)–8–2	Demonstrates understanding of the relative magnitude of numbers by ordering or comparing rational numbers, common irrational numbers, numbers with whole number or fractional bases and whole number exponents, square roots, absolute values, integers, or numbers represented in scientific notation using number lines or equality and inequality symbols. (Local)	HA1-015	Graphing Real Numbers Using a Number Line
		HA1-810	Simplifying Expressions Using the Multiplication Properties of Exponents
		HA1-030	Using Opposites and Absolute Values
		HA1-480	Finding the Square Roots of Rational Numbers
		MPA-021	Converting Between Standard and Scientific Notation
M(N&O)–8–4	Accurately solves problems involving proportional reasoning (percent increase or decrease, interest rates, markups, or rates); multiplication or division of integers; and squares, cubes, and taking square or cube roots. (Local)	MPA-087	Finding Percent Increase and Decrease
		MPA-126	Solving Real-World Problems Involving Sales Tax
		MPA-127	Solving Real-World Problems Involving Discounts, Markup, and Commission
		MPA-128	Solving Real-World Problems Involving Simple and Compound Interest
		MPA-051	Multiplying Integers with Like and Unlike Signs
		MPA-052	Dividing Integers with Like and Unlike Signs
		HA1-492	Simplifying Square and Cube Roots
M(N&O)–8–6	Uses a variety of mental computation strategies to solve problems (e.g., using compatible numbers, applying properties of operations, using mental imagery, using patterns) and to determine the reasonableness of answers; and mentally calculates benchmark perfect squares and related square roots determines the part of a number using benchmark percents and related fractions (Local)	HA1-480	Finding the Square Roots of Rational Numbers
		MPA-081	Converting Fractions, Decimals, and Percents I
		MPA-082	Converting Fractions, Decimals, and Percents II
		HA1-003	Order of Operations

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M(N&O)–8–7	Makes estimates in a given situation (including tips, discounts, tax, and the value of a non-perfect square root as between two whole numbers) by identifying when estimation is appropriate, selecting the appropriate method of estimation; determining the level of accuracy needed given the situation; analyzing the effect of the estimation method on the accuracy of results; and evaluating the reasonableness of solutions appropriate to grade level GLEs across content strands. (Local)	MPA-133	Distinguishing Between Exact and Approximate Answers
		MPA-006	Determining Reasonableness of Answers and Appropriate Method of Computation
		MPA-033	Estimating Computations with Fractions and Mixed Numbers
		MPA-004	Using Rounding to Estimate
		MPA-005	Estimating Products and Quotients Using Patterns
		MPA-003	Using Four-Step Plan for Problem Solving
M(N&O)–8–8	Applies properties of numbers (odd, even, remainders, divisibility, and prime factorization) and field properties (commutative, associative, identity [including the multiplicative property of one, e.g., $20 \times 23 = 20+3 = 23$, so $20 = 1$], distributive, inverses) to solve problems and to simplify computations, and demonstrates conceptual understanding of field properties as they apply to subsets of real numbers when addition and multiplication are not defined in the traditional ways. (Local)	Throughout	
GEOMETRY AND MEASUREMENT			
M(G&M)–8–2	Applies the Pythagorean Theorem to find a missing side of a right triangle, or in problem solving situations. (Local)	HA1-515	Using the Pythagorean Theorem
		HA1-516	Applications of the Pythagorean Theorem
M(G&M)–8–5	Applies concepts of similarity to determine the impact of scaling on the volume or surface area of three-dimensional figures when linear dimensions are multiplied by a constant factor; to determine the length of sides of similar triangles, or to solve problems involving growth and rate. (Local)	MPA-121	Identifying Similar and Congruent Polygons Using Proportions
		MPA-111	Comparing Perimeters, Areas, and Volumes of Similar Geometric Figures and Solids
		MPA-155	Comparing and Converting Rates
M(G&M)–8–6	Demonstrates conceptual understanding of surface area or volume by solving problems involving surface area and volume of rectangular prisms, triangular prisms, cylinders, pyramids, or cones. Expresses all measures using appropriate units. (Local)	MPA-106	Identifying a Solid Figure From a Net
		MPA-073	Finding the Surface Area of Rectangular Prisms
		MPA-074	Finding the Surface Area of Cylinders
		MPA-075	Finding the Volume of Rectangular Prisms
		MPA-076	Finding the Volume of Cylinders
		MPA-077	Solving Problems Using a Formula
		MPA-115	Finding the Volumes of Prisms, Cylinders, Pyramids, and Cones Using Models
		MPA-111	Comparing Perimeters, Areas, and Volumes of Similar Geometric Figures and Solids
FUNCTIONS AND ALGEBRA			
M(F&A)–8–1	Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, graphs, or in problem situations; and generalizes a linear relationship (non-recursive explicit equation); generalizes a linear relationship to find a specific case; generalizes a nonlinear relationship using words or symbols; or generalizes a common nonlinear relationship to find a specific case. (Local)	MPA-142	Solving Problems With Linear Functions and Direct Variation
		MPA-150	Identifying and Graphing Linear and Nonlinear Functions
		MPA-104	Recognizing Patterns
		MPA-270	Generating Algebraic Expressions from Patterns of Models

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M(F&A)–8–2	Demonstrates conceptual understanding of linear relationships ($y = kx$; $y = mx + b$) as a constant rate of change by solving problems involving the relationship between slope and rate of change; informally and formally determining slopes and intercepts represented in graphs, tables, or problem situations; or describing the meaning of slope and intercept in context; and distinguishes between linear relationships (constant rates of change) and nonlinear relationships (varying rates of change) represented in tables, graphs, equations, or problem situations; or describes how change in the value of one variable relates to change in the value of a second variable in problem situations with constant and varying rates of change. (Local)	MPA-142	Solving Problems With Linear Functions and Direct Variation
		MPA-150	Identifying and Graphing Linear and Nonlinear Functions
		MPA-104	Recognizing Patterns
		MPA-270	Generating Algebraic Expressions from Patterns of Models
M(F&A)–8–3	Demonstrates conceptual understanding of algebraic expressions by evaluating and simplifying algebraic expressions (including those with square roots, whole number exponents, or rational numbers); or by evaluating an expression within an equation. (Local)	MPA-041	Writing Simple Algebraic Expressions from Phrases
		MPA-014	Evaluating Expressions for Given Variables
		HA1-810	Simplifying Expressions Using the Multiplication Properties of Exponents
		MPA-101	Solving Two-Step Equations by Combining Like Terms
		MPA-170	Solving Two-Step Equations Using the Distributive Property
		MPA-175	Solving Equations with Variables on Both Sides
M(F&A)–8–4	Demonstrates conceptual understanding of equality by showing equivalence between two expressions (expressions consistent with the parameters of the left- and right-hand sides of the equations being solved at this grade level) using models or different representations of the expressions, solving formulas for a variable requiring one transformation (e.g., $d = rt$; $d/r = t$); by solving multi-step linear equations with integer coefficients; by showing that two expressions are or are not equivalent by applying commutative, associative, or distributive properties, order of operations, or substitution; and by informally solving problems involving systems of linear equations in a context. (Local)	MPA-100	Solving Two-Step Equations with Positive Coefficients
		MPA-165	Solving Two-Step Equations with Negative Coefficients
		MPA-101	Solving Two-Step Equations by Combining Like Terms
		MPA-170	Solving Two-Step Equations Using the Distributive Property
		MPA-175	Solving Equations with Variables on Both Sides
		MPA-077	Solving Problems Using a Formula
DATA, STATISTICS, AND PROBABILITY			
M(DSP)–8–1	Interprets a given representation (line graphs, scatter plots, histograms, or box-and-whisker plots) to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (Local)	MPA-092	Reading and Interpreting Bar, Line, and Circle Graphs
		MPA-131	Interpreting and Creating Histograms
		MPA-132	Interpreting and Creating Scatterplots
		MPA-097	Constructing Box-and-Whisker Plots
		MPA-098	Making Predictions from Graphs and Choosing the Correct Graph
M(DSP)–8–2	Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (mean, median, or mode), dispersion (range or variation), outliers, quartile values, or estimated line of best fit to analyze situations, or to solve problems; and evaluates the sample from which the statistics were developed (bias, random, or non-random). (Local)	MPA-095	Find the Mean, Median, and Mode
		MPA-840	Interpreting Data (Bias)

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		MPA-097	Constructing Box-and-Whisker Plots
		MPA-132	Interpreting and Creating Scatterplots
M(DSP)–8–3	Organizes and displays data using scatter plots to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems; or identifies representations or elements of representations that best display a given set of data or situation, consistent with the representations required in M(DSP)–8–1. (Local)	MPA-132	Interpreting and Creating Scatterplots
		MPA-098	Making Predictions from Graphs and Choosing the Correct Graph
		MPA-099	Recognizing Misleading Statistics and Graphs
		MPA-840	Interpreting Data
M(DSP)–8–4	Uses counting techniques to solve problems in context involving combinations or permutations using a variety of strategies (e.g., organized lists, tables, tree diagrams, models, Fundamental Counting Principle, or others). (Local)	MPA-089	Using Tree Diagrams
		MPA-091	Finding the Number of Combinations of a Set of Objects
M(DSP)–8–5	For a probability event in which the sample space may or may not contain equally likely outcomes, determines the experimental or theoretical probability of an event in a problem-solving situation; and predicts the theoretical probability of an event and tests the prediction through experiments and simulations; and compares and contrasts theoretical and experimental probabilities. (Local)	MPA-090	Finding the Probability of Simple Real-Life Events
		MPA-112	Constructing Sample Spaces for Compound Events (Dependent and Independent)
		MPA-113	Finding the Probability of Compound Events Through Experimentation
		MPA-114	Finding the Odds of Events and Experimental Probability from a Math Model
M(DSP)–8–6	In response to a teacher or student generated question or hypothesis decides the most effective method (e.g., survey, observation, experimentation) to collect the data (numerical or categorical) necessary to answer the question; collects, organizes, and appropriately displays the data; analyzes the data to draw conclusions about the question or hypothesis being tested while considering the limitations that could affect interpretations; and when appropriate makes predictions; and asks new questions and makes connections to real world situations. (Local)	MPA-840	Interpreting Data (Journal & Problem Sets of the Day)

MM1-Fundamentals of Mathematics

MPA- Pre-Algebra

HA1-Algebra 1

HGM - Geometry (New course in development)

Note: Standards were taken from the Grade-Span Expectations for 8th Grade Mathematics document adopted by the New Hampshire State Board of Education in June 2006.