

Pre-Algebra

Strand	Common Curriculum Goal	Standard	Unit Name	Course Topic Description
MA.CM.CE Calculations and Estimations	Understand numbers, ways of representing numbers, relationships among numbers, and number systems	MA.CM.CE.01 Compare real numbers	Basics	Integer Math
		MA.CM.CE.02 Order and compare numbers expressed in scientific notation to each other and to other forms of real numbers		
		MA.CM.CE.03 Recognize that the set of real numbers contains the set of irrational numbers and the set of rational numbers and know the difference between them		
		MA.CM.CE.04 Locate real numbers on a number line (including approximations of irrational numbers)	Basics	Integer Math
		MA.CM.CE.05 Apply equivalent forms of real numbers to solve problems	Basics	Integer Math
MA.CM.CE Calculations and Estimations	Compute fluently and make reasonable estimates	MA.CM.CE.06 Compute with real numbers, including absolute value and numbers expressed in scientific notation	Basics	Absolute Value
		MA.CM.CE.07 Compute with integer exponents and whole number roots	Basics	Exponents
		MA.CM.CE.08 Mentally multiply and divide by powers of 10 to estimate results of computations involving numbers expressed in scientific notation	Number Basics	Rounding
		MA.CM.CE.09 Develop and use strategies to estimate the results of real number computations, determine the amount of error, and judge the reasonableness of results	Number Basics	Rounding
		MA.CM.CE.10 Estimate the results of computations with integer powers and roots of real numbers.	Basics	Exponents
MA.CM.CE Calculations and Estimations	Understand meanings of operations and how they relate to one another	MA.CM.CE.11 Recognize that taking the n th root of a number corresponds to prime factorization	Basics	Factors
		MA.CM.CE.12 Use the inverse operations of n th power and n th root to solve problems and check solutions	Basics	Exponents
		MA.CM.CE.13 Apply the associative, commutative, and distributive properties to simplify computations with real	Number Basics	Number Properties

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		numbers		
		MA.CM.CE.14 Use properties of numbers to demonstrate whether assertions are true or false	Number Basics	Number Properties
MA.CM.SP Statistics and Probability	Select and use appropriate statistical methods to analyze data	MA.CM.SP.01 Estimate from a graph or a set of data the mean and standard deviation of a normal distribution and draw conclusions about the distribution of data using measures of center and spread (e.g., analyze a variety of summary statistics and graphical displays)	Probability and Data Analysis	Data Analysis Projects
		MA.CM.SP.02 Analyze bivariate data and identify the type of function (linear, quadratic, exponential) that could be used to model the data	Word Problems	Strategies
			Equations	Solving Simple Equations
MA.CM.SP Statistics and Probability	Understand and apply basic concepts of probability	MA.CM.SP.03 Compute the probability of a compound event (e.g., toss a coin three times to find the probability of two heads)	Probability and Data Analysis	Probability
		MA.CM.SP.04 Determine probabilities of dependent and independent events (e.g., use colored marbles with and without replacement)	Probability and Data Analysis	Probability
		MA.CM.SP.05 Use conditional probability to solve problems (e.g., from a sample set for the roll of two tetrahedral die; given that a sum is even, what is the probability that the sum is 6?)	Probability and Data Analysis	Probability
		MA.CM.SP.06 Determine all possible outcomes of a particular event or all possible arrangements of objects in a given set by applying counting strategies, combinations, and permutations	Probability and Data Analysis	Probability
MA.CM.SP Statistics and Probability	Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	MA.CM.SP.07 Determine appropriate designs for simulations (surveys, observational studies, and experiments) and modeling to study a problem and construct empirical probability distributions to represent results	Word Problems	Strategies
		MA.CM.SP.08 Use matrices, histograms, scatter plots, stem-and-leaf plots, and box-and whisker-plots to interpret	Word Problems	Strategies
			Probability & Data	Probability



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		data	Analysis	
		MA.CM.SP.09 Identify examples of populations that are normally distributed	Word Problems	
MA.CM.SP Statistics and Probability	Develop and evaluate inferences and predictions that are based on data	MA.CM.SP.10 Make inferences and predictions from data in histograms, scatter plots, and parallel box plots	Word Problems	Strategies
			Probability & Data Analysis	Probability
		MA.CM.SP.11 Make predictions about populations based on reported sample statistics	Word Problems	Strategies
			Probability & Data Analysis	Probability
MA.CM.SP.12 Understand that inferences about a population drawn from a sample involve uncertainty and that the role of statistics is to measure that uncertainty	Probability and Data Analysis	Probability		
MA.CM.SP Statistics and Probability	Understand patterns, relations, and functions	MA.CM.AR.01 Represent and generalize sequences resulting from linear, quadratic, and exponential relationships using recursive or explicit formulas, tables of values, and graphs	Equations	Linear Equations
			Probability & Data Analysis	Probability
		MA.CM.AR.02 Produce a valid conjecture using inductive reasoning by generalizing from a pattern of observations	Geometric Concepts	Arithmetic Sequences
			Word Problems	Strategies
		MA.CM.AR.03 Evaluate and make a table for two-variable formulas and match a graph or table of values to its formula	Equations	Linear Equations
			Probability & Data Analysis	Probability
		MA.CM.AR.04 Identify independent and dependent variables and determine the domain and range of a function in a problem situation	Equations	Linear Equations
			Probability & Data Analysis	Probability
MA.CM.SP Statistics and Probability	Represent and analyze mathematical situations and structures using algebraic symbols	MA.CM.AR.05 Algebraically represent situations and solve problems involving quadratic and exponential equations, including exponential growth and decay	Equations	Linear Equations
			Probability & Data Analysis	Probability
		MA.CM.AR.06 Use graphs to solve non-linear equations, including quadratics	Equations	Linear Equations
			Polynomials	Evaluating Polynomials

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		MA.CM.AR.07 Represent and solve systems of linear equations with two variables using simultaneous equations and by graphing.	Equations	Linear Equations			
		MA.CM.AR.08 Recognize and generate equivalent forms for algebraic expressions, including combining like terms and expanding binomials	Polynomials	Evaluating Polynomials			
			Factoring	Factoring			
		MA.CM.AR.09 Evaluate algebraic expressions and formulas by substituting real numbers	Polynomials	Evaluating Polynomials			
			Factoring	Factoring			
		MA.CM.AR.10 Translate between and interpret quadratic and exponential relationships represented by words, symbols, tables, and graphs	Polynomials	Evaluating Polynomials			
			Factoring	Factoring			
		MA.CM.AR.11 Determine and interpret maxima or minima and zeros of quadratic functions, and linear functions where $y = \text{constant}$	Equations	Linear Equations			
MA.CM.AR.12 Graph linear inequalities in two variables							
MA.CM.AR.13 Graph quadratic and exponential equations							
MA.CM.SP Statistics and Probability	Use mathematical models to represent and understand quantitative relationships	MA.CM.AR.15 Model situations, make predictions and inferences, and solve problems using linear, quadratic, and exponential functions	Word Problems	Strategies			
			Polynomials	Evaluating Polynomials			
			Equations	Linear Equations			
			Probability & Data Analysis	Probability			
		MA.CM.AR.16 Determine when data represented in a table or graph represents a linear, quadratic, or exponential relationship	Equations	Linear Equations			
			Probability & Data Analysis	Probability			
			MA.CM.SP Statistics and Probability	Analyze change in various contexts	MA.CM.AR.17 Approximate and interpret rates of change in graphical and numeric data	Equation	Linear Equations
					MA.CM.AR.18 Analyze the nature of change of each	Polynomials	Evaluating Polynomials

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		variable in a non-linear relationship as suggested by a table of values, a graph, or a formula		
MA.CM.ME Measurement	Understand measurable attributes of objects and the units, systems and processes of measurement	MA.CM.ME.01 Determine the appropriate units, scales, and tools for problem situations involving measurement	Basic Geometry	Geometric Formulas
		MA.CM.ME.02 Solve problems involving unit conversions (e.g., mile per hour to feet per second) given the unit equivalencies.	Word Problems	Strategies
		MA.CM.ME.03 Determine the precision of a given measuring tool (e.g., 1 degree for a standard protractor)		
MA.CM.ME Measurement	Apply appropriate techniques, tools, and formulas to determine measurements	MA.CM.ME.04 Develop and use strategies and formulas for calculating surface area and volume of cones and spheres	Basic Geometry	Three Dimensional Measurements
		MA.CM.ME.05 Use formulas to solve problems involving finding missing dimensions given perimeter, area, surface area, and volume of polygons, circles, prisms, pyramids, cones, cylinders, and spheres	Basic Geometry Basic Geometry	Geometric Formulas Three Dimensional Measurements
		MA.CM.ME.06 Develop and understand, and use the formula for determining arc length (e.g., portion of a circle).		
		MA.CM.ME.07 Determine perimeter and area of shapes of circles and polygons (annulus, etc.) in context	Basic Geometry	Geometric Formulas
		MA.CM.ME.08 Determine the surface area and volume of a complex figure composed of a combination of two or more geometric figures or a figure derived from a regular solid (e.g., hemisphere, frustum of a cone)		
		MA.CM.ME.09 Compare and contrast the formulas for surface area and volume of cylinders and cones	Basic Geometry	Three Dimensional Measurements
		MA.CM.ME.10 Determine a shape that has minimum or maximum perimeter, area, surface area, or volume under specified conditions	Basic Geometry	Geometric Formulas Three Dimensional Measurements
		MA.CM.ME.11 Make and use scale drawings and models	Geometric Concepts	Proportions



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		to solve problems		
MA.CM.PS Mathematical Problem Solving	Select, apply, and translate among mathematical representations to solve problems.	MA.CM.PS.01 Interpret the concepts of a problem-solving task and translate them into mathematics	Word Problems	Strategies
			Basic Geometry	Geometric Formulas
MA.CM.PS Mathematical Problem Solving	Apply and adapt a variety of appropriate strategies to solve problems.	MA.CM.PS.01 Choose strategies that can work and then carry out the strategies chosen	Word Problems	Strategies
			Basic Geometry	Geometric Formulas
MA.CM.PS Mathematical Problem Solving	Monitor and reflect on the process of mathematical problem solving.	MA.CM.PS.03 Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution	Word Problems	Strategies
			Basic Geometry	Geometric Formulas
			Number Basics	Rounding
MA.CM.PS Mathematical Problem Solving	Communicate mathematical thinking coherently and clearly. Use the language of mathematics to express mathematical ideas precisely.	MA.CM.PS.04 Use pictures, symbols, and/or vocabulary to convey the path to the identified solution	Word Problems	Strategies
			Basic Geometry	Geometric Formulas
MA.CM.PS Mathematical Problem Solving	Accurately solve problems that arise in mathematics and other contexts.	MA.CM.PS.05 Accurately solve problems using mathematics	Word Problems	Strategies
			Basic Geometry	Geometric Formulas