

Algebra I

State Goals	Learning Standards	Benchmarks	Unit Name	Course Topic Description
6 Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.	6.A Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.	6.A.4 Identify and apply the associative, commutative, distributive and identity properties of real numbers, including special numbers such as pi and square roots.	Real Numbers	Evaluating Division Expressions
				Division of Rational Numbers
			Variables and Expressions	Writing and Justifying Steps Using Properties
				The Distributive Property
				The Commutative Property
				The Associative Property
	6.B Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.	6.B.4 Select and use appropriate arithmetic operations in practical situations including calculating wages after taxes, developing a budget and balancing a checkbook.		
	6.C Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.	6.C.4 Determine whether exact values or approximations are appropriate (e.g., bid a job, determine gas mileage for a trip).	Equations	Equations with Variables on Each Side
	6.D Solve problems using comparison of quantities, ratios, proportions and percents.	6.D.4 Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.		
7 Estimate, make and use measurements	7.A Measure and compare quantities using appropriate units,	7.A.4a Apply units and scales to describe and compare numerical data and physical objects.	Solving Systems	Analyzing Statistical Data
		7.A.4b Apply formulas in a wide variety of theoretical and	Equations	Distance Formula

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of objects, quantities and relationships and determine acceptable levels of accuracy.	instruments and methods	7.A.4a Apply units and scales to describe and compare numerical data and physical objects.	Solving Systems	Analyzing Statistical Data	
		7.A.4b Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density and monetary values.	Equations	Distance Formula Work Problems Rate Problems	
			Real Numbers	Estimation Estimation with Real Numbers	
	7.B Estimate measurements and determine acceptable levels of accuracy.	7.B.4 Estimate and measure the magnitude and directions of physical quantities (e.g., velocity, force, slope) using rulers, protractors and other scientific instruments including timers, calculators and computers.	Real Numbers	Estimation with Real Numbers Estimation	
	7.C Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.	7.C.4a Make indirect measurements, including heights and distances, using proportions (e.g., finding the height of a tower by its shadow). 7.C.4b Interpret scale drawings and models using maps and blueprints. 7.C.4c Convert within and between measurement systems and monetary systems using technology where appropriate.	Equations	Ratios and Proportions	
	8 Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.	8.A Describe numerical relationships using variables and patterns.	8.A.4a Use algebraic methods to convert repeating decimals to fractions.		
			8.A.4b Represent mathematical patterns and describe their properties using variables and mathematical symbols.	Functions and Linear Equations	Scatter Plots and Correlation Number Patterns Line of Fit Linear Patterns
		Variables and Expressions		Expressions with Powers Algebraic Expressions	
8.B Interpret and		8.B.4a Represent algebraic concepts with physical		Inequalities	Inequalities in Two



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	describe numerical relationships using tables, graphs and symbols.	materials, words, diagrams, tables, graphs, equations and inequalities and use appropriate technology.	Inequalities	Variables
				Solving Inequalities by Addition and Subtraction
				Absolute Value Inequalities
				Compound Inequalities
				Multi-Step Inequalities
				Graphing Inequalities in Two Variables
				Solving Inequalities Using Multiplication and Division
			Equations	Multiplication and Division in Equations
				Equations with Variables on Each Side
				Parentheses in Equations
				Equations and Problem Solving
				Mixture Problems
				Solving Multi-Step Equations
				Equations
				Rate Problems
				Solving Problems
				Distance Formula
			Exponentials	Exponential Equations
			Variables and Expressions	Tables and Graphs
				Expressions with Powers
Algebraic Expressions				

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		8.B.4b Use the basic functions of absolute value, square root, linear, quadratic and step to describe numerical relationships.	Quadratics and Radicals	Graphing Quadratics	
				Graphing Quadratic Functions	
	8.C Solve problems using systems of numbers and their properties.	8.C.4a Analyze and report the effects of changing coefficients, exponents and other parameters on functions and their graphs.		Functions and Linear Equations Variables and Expressions	Graphing an Equation Using Points
					Functions
					Exponential Equations
					Graphing an Equation Using Intercepts
				Solving Systems	Review of Graphing Linear Equations
				Variables and Expressions	Expressions with Powers
					Fractional Exponents
					Problem Solving using Exponents and Roots
					Exponents
				8.C.4b Apply algebraic properties and procedures with matrices, vectors, functions and sequences using data found in business, industry and consumer situations.	
	Arithmetic Sequences				
			Exponentials	Geometric Sequence Formulas	
				Geometric Sequences	
8.D Use algebraic concepts and procedures to represent and solve problems.	8.D.4 Formulate and solve linear and quadratic equations and linear inequalities algebraically and investigate nonlinear inequalities using graphs, tables, calculators and computers.		Functions and Linear Equations	Slope-Intercept Form	
				Writing Linear Equations	
				Linear Patterns	
			Inequalities	Graphing Inequalities in Two Variables	
				Inequalities in Two	



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				Variables
				Multi-Step Inequalities
				Solving Inequalities by Addition and Subtraction
				Compound Inequalities
				Solving Inequalities Using Multiplication and Division
			Equations	Parentheses in Equations
				Addition and Subtraction in Equations
				Mixture Problems
				Solving Multi-Step Equations
				Formulas as Equations
				Solving Problems
				Equations with Variables on Each Side
				Multiplication and Division in Equations
			Quadratics and Radicals	Solving by Using Square Roots
				Solving Quadratic Equations with Graphs
				The Quadratic Formula
			Polynomials	Solving Equations Using Factoring
				Factoring Other Trinomials
				Solving Equations by Factoring Trinomials

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			Variables and Expressions	Tables and Graphs
			Exponentials	Exponential Equations
9 Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.	9.A Demonstrate and apply geometric concepts involving points, lines, planes and space.	9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern.		
		9.A.4b Make perspective drawings, tessellations and scale drawings, with and without the use of technology.		
	9.B Identify, describe, classify and compare relationships using points, lines, planes and solids.	9.B.4 Recognize and apply relationships within and among geometric figures.		
		9.C Construct convincing arguments and proofs to solve problems.	9.C.4a Construct and test logical arguments for geometric situations using technology where appropriate.	Variables and Expressions
		9.C.4b Construct and communicate convincing arguments for geometric situations.		Logical Reasoning
		9.C.4c Develop and communicate mathematical proofs (e.g., two-column, paragraph, indirect) and counter examples for geometric statements.		Inductive Reasoning
	9.D Use trigonometric ratios and circular functions to solve problems.	9.D.4 Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.		
10 Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty	10.A Organize, describe and make predictions from existing data.	10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.	Solving Systems	Analyzing Statistical Data
				Histograms
		Box Plots		
		10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.	Variables and Expressions	Tables and Graphs
		Solving Systems	Histograms	
			Statistics	
				Analyzing Statistical Data

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using concepts of probability.			Variables and Expressions	Stem and Leaf Plots Mean, Median and Mode
		10.A.4c Predict from data using interpolation, extrapolation and trend lines, with and without the use of technology.		
	10.B Formulate questions, design data collection methods, gather and analyze data and communicate findings.	10.B.4 Design and execute surveys or experiments, gather data to answer relevant questions, and communicate results and conclusions to an audience using traditional methods and contemporary technology.	Solving Systems	Analyzing Statistical Data
				Histograms
	10.C Determine, describe and apply the probabilities of events.	10.C.4a Solve problems of chance using the principles of probability including conditional settings.	Rational Expressions	More about the Multiplication Principle
				Using Data to Make Predictions
The Basics of Probability				
	10.C.4b Design and conduct simulations (e.g., waiting times at restaurant, probabilities of births, likelihood of game prizes), with and without the use of technology.		Counting: An introduction to the Multiplication Principle	
	10.C.4c Propose and interpret discrete probability distributions, with and without the use of technology.			