



Alignment Document
State of Illinois and Aventa Learning Algebra I

Algebra I
2005-2007 Benchmark Blueprint

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
			Real Numbers	Division of Rational Numbers
			Real Numbers	Writing and Justifying Steps Using Properties
			Variables and Expressions	The Distributive Property
			Variables and Expressions	The Commutative Property
			Variables and Expressions	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 of objects, quantities and relationships and determine acceptable levels of accuracy.	7.A Measure and compare quantities using appropriate units, 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
			Equations	Work Problems
			Equations	Rate Problems
			Real Numbers	Estimation
			Real Numbers	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
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).	Equations	Ratios and Proportions	
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.			
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



			Functions and Linear Equations	Number Patterns
			Functions and Linear Equations	Line of Fit
			Functions and Linear Equations	Linear Patterns
			Variables and Expressions	Expressions with Powers
			Variables and Expressions	Algebraic Expressions
	8.B Interpret and describe numerical relationships using tables, graphs and symbols.	8.B.4a Represent algebraic concepts with physical materials, words, diagrams, tables, graphs, equations and inequalities and use appropriate technology.	Inequalities	Inequalities in Two Variables
			Inequalities	Solving Inequalities by Addition and Subtraction
			Inequalities	Absolute Value Inequalities
			Inequalities	Compound Inequalities
			Inequalities	Multi-Step Inequalities
			Inequalities	Graphing Inequalities in Two Variables
			Inequalities	Solving Inequalities Using Multiplication and Division
			Equations	Multiplication and Division in Equations
			Equations	Equations with Variables on Each Side



			Equations	Parentheses in Equations
			Equations	Equations and Problem Solving
			Equations	Mixture Problems
			Equations	Solving Multi-Step Equations
			Equations	Equations
			Equations	Rate Problems
			Equations	Solving Problems
			Equations	Distance Formula
			Exponentials	Exponential Equations
			Variables and Expressions	Tables and Graphs
			Variables and Expressions	Expressions with Powers
			Variables and Expressions	Algebraic Expressions
		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
			Quadratics and Radicals	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	Graphing an Equation Using Points
			Functions and Linear Equations	Functions



			Exponentials	Exponential Equations
			Functions and Linear Equations	Graphing an Equation Using Intercepts
			Solving Systems	Review of Graphing Linear Equations
			Variables and Expressions	Expressions with Powers
			Variables and Expressions	Fractional Exponents
			Variables and Expressions	Problem Solving using Exponents and Roots
			Variables and Expressions	Exponents
		8.C.4b Apply algebraic properties and procedures with matrices, vectors, functions and sequences using data found in business, industry and consumer situations.	Functions and Linear Equations	Functions
			Functions and Linear Equations	Arithmetic Sequences
			Functions and Linear Equations	Linear Patterns
			Exponentials	Geometric Sequence Formulas
			Exponentials	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
			Functions and Linear Equations	Writing Linear Equations



			<p>Functions and Linear Equations</p> <p>Inequalities</p> <p>Inequalities</p> <p>Inequalities</p> <p>Inequalities</p> <p>Inequalities</p> <p>Inequalities</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p> <p>Equations</p>	<p>Linear Patterns</p> <p>Graphing Inequalities in Two Variables</p> <p>Inequalities in Two Variables</p> <p>Multi-Step Inequalities</p> <p>Solving Inequalities by Addition and Subtraction</p> <p>Compound Inequalities</p> <p>Solving Inequalities Using Multiplication and Division</p> <p>Parentheses in Equations</p> <p>Addition and Subtraction in Equations</p> <p>Mixture Problems</p> <p>Solving Multi-Step Equations</p> <p>Formulas as Equations</p> <p>Solving Problems</p> <p>Equations with Variables on Each Side</p> <p>Multiplication and Division in Equations</p>
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			Quadratics and Radicals	Solving by Using Square Roots
			Quadratics and Radicals	Solving Quadratic Equations with Graphs
			Quadratics and Radicals	The Quadratic Formula
			Polynomials	Solving Equations Using Factoring
			Polynomials	Factoring Other Trinomials
			Polynomials	Solving Equations by Factoring Trinomials
			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 Variables and Expressions	Deductive Reasoning Logical Reasoning

			Variables and Expressions	Inductive Reasoning
		9.C.4b Construct and communicate convincing arguments for geometric situations.		
		9.C.4c Develop and communicate mathematical proofs (e.g., two-column, paragraph, indirect) and counter examples for geometric statements.		
	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 using concepts of probability.	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
			Solving Systems	Histograms
			Solving Systems	Box Plots
			Variables and Expressions	Tables and Graphs
		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.	Solving Systems	Histograms
Solving Systems	Statistics			
Solving Systems	Analyzing Statistical Data			
Variables and Expressions	Stem and Leaf Plots			
Variables and Expressions	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	10.B.4 Design and execute surveys or		Solving Systems	Analyzing Statistical Data

	data collection methods, gather and analyze data and communicate findings.	experiments, gather data to answer relevant questions, and communicate results and conclusions to an audience using traditional methods and contemporary technology.	Solving Systems	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
Rational Expressions			Using Data to Make Predictions	
Rational Expressions			The Basics of Probability	
Rational Expressions			Counting: An introduction to the Multiplication Principle	
		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.		
		10.C.4c Propose and interpret discrete probability distributions, with and without the use of technology.		