



Occupational Course of Study Algebra I Curriculum Crosswalk

The following document is to be used by Occupational Course of Study (OCS) teachers and school administrators to prepare for the transition from the current OCS standards to the new 2010 Mathematics Common Core Standards. This crosswalk document is intended to be used for OCS Algebra I. Students who are enrolled in OCS Algebra I will be assessed with the current Algebra I End of Course Test with accommodation as specified in their Individualized Education Program (IEP). In addition, they will participate in an item tryout for the new EXTEND II Algebra I End-of-Course Test aligned to the Common Core.

At this time, the writers of the Common Core State Standards for Mathematics are in the process of developing specific high school courses. As a result, this document is a DRAFT. The Common Core standards below may represent excess content or not show content that would be included in the Algebra I course. Updated documents will be released as information becomes available.

DRAFT

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	Cluster	Comments
					Text of objective	
Numbers & Operations	1.01	Write equivalent forms of algebraic expressions to solve problems				
		a) Apply the laws of exponents				Moved to 8 th grade Common Core..
		b) Operate with polynomials	Arithmetic w/ Polynomials &	AAPR.1	Perform arithmetic operations on polynomials Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Division of polynomials is not addressed in the Common Core.
	c) Factor polynomials	Algebra – Seeing Structure in Expressions	ASSE.2	Interpret the structure of expressions Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$		
1.02	Use formulas and algebraic expressions, including iterative and recursive forms, to model and solve problems.	Algebra – Seeing Structure in Expressions	ASSE.4	Write expressions in equivalent forms to solve problems Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.		

NC SCOS			Common Core			
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					Text of objective	
			Building Functions	FBF.2	Build a function that models a relationship between two quantities	
					Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	
			Interpreting Functions	FIF.3	Understand the concept of a function and use function notation Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. <i>For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.</i>	
	1.03	Model and solve problems using direct variation.				Moved to 7th grade Common Core.
Geometry & mea	2.01	Find the lengths and midpoints of segments to solve problems.	The Complex Number System	NCN.6	Represent complex numbers and their operations on the complex plane. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	Finding the lengths of segments is in 8 th grade Common Core.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	Cluster	Comments
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2.02		Use the parallelism or perpendicularity of lines and segments to solve problems.	Expressing Geometric Properties w/Equations	GGPE.4	<p>Use coordinates to prove simple geometric theorems algebraically</p> <p>Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.</p>	Prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$ is not in the NC SCOS.
				GGPE.5	<p>Use coordinates to prove simple geometric theorems algebraically</p> <p>Prove the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</p>	
				GGPE.7	<p>Use coordinates to prove simple geometric theorems algebraically</p> <p>Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</p>	

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Strand	Objective	Text of objective	Domain	Standard	Cluster	Text of objective	Comments		
Data Analysis & Probability	3.01	Use matrices to display and interpret data.	Number & Quantity – Vector & Matrix Quantities	NVM.6	Perform operations on matrices and use matrices in applications			(+ Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.	
					Perform operations on matrices and use matrices in applications				
	3.02	Operate (addition, subtraction, scalar multiplication) with matrices to solve problems.		NVM.7	Perform operations on matrices and use matrices in applications	(+ Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	Multiplication involves only scalar multiplication in the NC SCOS.		
					Perform operations on matrices and use matrices in applications				
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	3.03	Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make predictions.		Interpreting Categorical & Quantitative Data	NVM.8	Perform operations on matrices and use matrices in applications	(+ Add, subtract, and multiply matrices of appropriate dimensions.	Multiplication involves only scalar multiplication in the NC SCOS.	
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3.03	Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make predictions.	Interpreting Categorical & Quantitative Data	SID.7	Interpret linear models	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.				
				Interpret linear models					
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3.03	Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make predictions.	Interpreting Categorical & Quantitative Data	SID.8	Interpret linear models	Compute (using technology) and interpret the correlation coefficient of a linear fit.				
				Interpret linear models					
3.03	Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make predictions.	Interpreting Categorical & Quantitative Data	SID.9	Interpret linear models	Distinguish between correlation and causation.				
				Interpret linear models					

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			Interpreting Categorical & Quantitative Data	SID.6	Summarize, represent, and interpret data on two categorical and quantitative variables Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	
					a) Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.	
					b) Informally assess the fit of a function by plotting and analyzing residuals.	
					c) Fit a linear function for a scatter plot that suggests a linear association.	
.Algebra	4.01	Use linear functions or inequalities to model and solve problems; justify results. a) Solve using tables, graphs, and algebraic properties. b) Interpret constants and coefficients in the context of the problem.	Algebra- Creating Equations	ACED.1	Create equations that describe numbers or relationships Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	Quadratic functions are in the Algebra I NC SCOS, 4.02. Exponential functions are in the Algebra I NC SCOS, 4.04. Rational functions are in the Algebra II NC SCOS. Justify results is not included in the Common Core.

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Strand	Objective	Text of objective	Domain	Standard	
			Algebra- Creating Equations	<p>Cluster</p> <p>Text of objective</p> <p>ACED.2</p> <p>Create equations that describe numbers or relationships Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p>	
			Interpreting Categorical & Quantitative Data	<p>Cluster</p> <p>Text of objective</p> <p>SID.7</p> <p>Interpret linear models Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p>	
			Interpreting Functions	<p>Cluster</p> <p>Text of objective</p> <p>FIF.4</p> <p>Interpret functions that arise in applications in terms of the context For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity</p>	

NC SCOS		Common Core		Comments
Strand	Objective	Domain	Standard	
	4.02	Reasoning with Equations & Inequalities	Solve equations and inequalities in one variable Solve quadratic equations in one variable.	
			a) Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	
			b) Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .	
4.03	Use systems of linear equations or inequalities in two variables to model and solve problems. Solve using tables, graphs, and algebraic properties; justify results.	Creating Equations	Create equations that describe numbers or relationships Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	
		Algebra- Reasoning with Equations & Inequalities	Solve systems of equations Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	

NC SCOS			Common Core		Comments
Strand	Objective	Text of objective	Domain	Standard	
			Algebra- Reasoning with Equations & Inequalities	Cluster Text of objective	
				Solve systems of equations Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	
				Represent and solve equations and inequalities graphically Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	
				Represent and solve equations and inequalities graphically Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	

NC SCOS			Common Core			
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4.04	Graph and evaluate exponential functions to solve problems.		Algebra- Reasoning with Equations & Inequalities	AREI.12	Represent and solve equations and inequalities graphically	
					Construct and compare linear and exponential models and solve problems	Distinguish between situations that can be modeled with linear functions and with exponential functions
			Functions – Linear, Quadratic & Exponential Models	FLE.1	a) Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	
					b) Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	
FLE.2	Construct and compare linear and exponential models and solve problems	c) Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another				
		Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).				