

ALGEBRA 1
2012-2013 SCOPE AND SEQUENCE

1st	Six Weeks	28 Days	<i>The recommended number of lessons is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.</i>
	Aug. 27 – Oct. 5, 2012		
		# of Lessons	Objectives
Unit 1 Demonstrating Patterns Using Multiple Representations Students study, develop, and analyze patterns through the use of multiple representations and make predictions.		5	4 (45-min) <u>Lessons: Patterns and Sequences</u> Ⓐ Ⓢ ALGI.1B Gather and record data and use data sets to determine functional relationships between quantities <i>and write a general equation describing the functional relationship.</i> Ⓢ ALGI.1D Represent relationships among quantities <i>by using and building</i> concrete models, <i>completing</i> tables, <i>constructing</i> graphs or diagrams, <i>writing</i> verbal descriptions, and <i>writing</i> equations and inequalities. Ⓢ ALGI.3A Use <i>manipulatives, drawings, verbal descriptions and</i> symbols to represent unknowns and variables <i>in real-world situations.</i> Ⓐ Ⓢ ALGI.3B Look for patterns <i>in finite differences, determine the value of the zero term, and write the algebraic representation for the given situation.</i>
		90-min. lessons or 10 45-min lessons	----- 6 (45-min) <u>Lessons: Predicting with Patterns</u> Ⓐ Ⓢ ALGI.1A Describe independent and dependent quantities in functional relationships. Ⓢ ALGI.1C Describe functional relationships for given problem situations, and write <i>linear equations</i> or inequalities and <i>quadratic equations</i> to answer questions arising from the situation. Ⓢ ALGI.1E Interpret and make decisions, predictions, and critical judgments from functional relationships. Ⓢ ALGI.2B Identify mathematical domains and ranges and determine reasonable domain and range values for given situations, <i>represented by</i> continuous or discrete data. Ⓐ Ⓢ ALGI.2C Interpret situations in terms of given graphs or create situations that fit given graphs.

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Unit 2 Solving Equations Using Proportional Reasoning and Algebraic Properties Students build upon their knowledge of proportional reasoning and algebraic properties to solve problems involving proportional change using multiple representations.		6 90-min. lessons or 12 45-min lessons	<p>6 (45-min) Lessons: Functional Relationships</p> <p>Ⓢ ALGI.1C Describe functional relationships for given problem situations, and write <i>linear equations</i> or inequalities and <i>quadratic equations</i> to answer questions arising from the situation.</p> <p>Ⓢ ALGI.1D Represent relationships among quantities by using and building concrete models, completing tables, constructing graphs or diagrams, writing verbal descriptions, and writing equations and inequalities.</p> <p>Ⓢ ALGI.3A Use <i>manipulatives, drawings, verbal descriptions, and symbols</i> to represent unknowns and variables in <i>real-world situations</i>.</p> <p>Ⓢ ALGI.4A Find specific function values; <i>add, subtract, multiply, or divide to simplify polynomial expressions; transform and solve equations including factoring as necessary in problem situations which are expressed in verbal, algebraic, or pictorial (algebra tiles) representations.</i></p> <p>Ⓐ Ⓢ ALGI.6G Relate direct variation to linear functions and solve problems involving proportional change using <i>concrete, pictorial, symbolic, verbal, and written representations.</i></p> <hr style="border-top: 1px dashed black;"/> <p>6 (45-min) Lessons: Modeling Equations</p> <p>Ⓢ ALGI.1D Represent relationships among quantities by using and building concrete models, completing tables, constructing graphs or diagrams, writing verbal descriptions, and writing equations and inequalities.</p> <p>Ⓢ ALGI.1E Interpret and make decisions, predictions, and critical judgments from functional relationships.</p> <p>Ⓢ ALGI.4A Find specific function values; <i>add, subtract, multiply, or divide to simplify polynomial expressions; transform and solve equations including factoring as necessary in problem situations which are expressed in verbal, algebraic, or pictorial (algebra tiles) representations.</i></p> <p>Ⓢ ALGI.4B Demonstrate <i>pictorially and algebraically</i> the commutative, associative, and distributive properties to simplify algebraic expressions.</p> <p>Ⓐ Ⓢ ALGI.7A Analyze situations involving linear functions <i>in forms of a graph, table, equation, or verbal description in order to formulate a linear equation or inequality to solve problems.</i></p> <p>Ⓢ ALGI.7B Investigate methods for solving linear equations and inequalities using <i>concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities involving one variable or two variables.</i></p> <p>Ⓐ Ⓢ ALGI.7C Interpret and determine the reasonableness of solutions to linear equations and inequalities.</p>

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2nd	Six Weeks	25 Days	The recommended number of lessons is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.
		Oct. 8 – Nov. 9, 2012	
		# of Lessons	Objectives
Unit 3 Equations and Inequalities Students apply proportionality and algebraic properties to solve multi-step linear equations and inequalities.		6 90-min. lessons or 12 45-min. lessons	8 (45-min) Lessons: Solving Equations Ⓡ ALGI.1D Represent relationships among quantities by using <i>and building</i> concrete models, <i>completing</i> tables, <i>constructing</i> graphs or diagrams, <i>writing</i> verbal descriptions, and <i>writing</i> equations and inequalities. Ⓢ ALGI.3A Use <i>manipulatives, drawings, verbal descriptions and symbols</i> to represent unknowns and variables <i>in real-world situations</i> . Ⓡ ALGI.4A Find specific function values; add, subtract, multiply, or divide to simplify polynomial expressions; transform and solve equations including factoring as necessary in problem situations which are expressed in verbal, algebraic, or pictorial (algebra tiles) representations. Ⓢ ALGI.4B <i>Demonstrate pictorially and algebraically</i> the commutative, associative, and distributive properties to simplify algebraic expressions. Ⓡ Ⓢ ALGI.7A Analyze situations involving linear functions <i>in forms of a graph, table, equation, or verbal description in order</i> to formulate a linear equation or inequality to solve problems. Ⓡ ALGI.7B Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities involving one variable or two variables. Ⓡ Ⓢ ALGI.7C Interpret and determine the reasonableness of solutions to linear equations and inequalities. <hr style="border-top: 1px dashed black;"/> 4 (45-min) Lessons: Solving Equations and Inequalities Ⓡ Ⓢ ALGI.7A Analyze situations involving linear functions <i>in forms of a graph, table, equation, or verbal description in order</i> to formulate a linear equation or inequality to solve problems. Ⓡ ALGI.7B Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities involving one variable or two variables. Ⓡ Ⓢ ALGI.7C Interpret and determine the reasonableness of solutions to linear equations and inequalities.
		4 90-min. lessons or 8 45-min. lessons	8 (45-min) Lessons: Patterns and Functions Ⓡ Ⓢ ALGI.1A Describe independent and dependent quantities in functional relationships. Ⓡ ALGI.1E Interpret and make decisions, predictions, and critical judgments from functional relationships. Ⓡ ALGI.2B Identify mathematical domains and ranges and determine reasonable domain and range values for given situations, <i>represented by</i> continuous or discrete data. Ⓡ Ⓢ ALGI.2C Interpret situations in terms of given graphs or create situations that fit given graphs. Ⓡ Ⓢ ALGI.4C Connect the function notation of " $y = $ " and " $f(x) = $ " for example, $y = x + 1$ and $f(x) = x + 1$. Ⓢ ALGI.5A Determine whether or not given situations can be represented by linear functions <i>by determining finite differences and writing an algebraic representation</i> .

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3rd Six Weeks	27 Days		<i>The recommended number of lessons is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.</i>
	Nov. 12 – Dec. 21, 2012		
	# of Lessons	Objectives	
<p>Unit 5 Representing Patterns as Equations and Graphs Students write various forms of linear equations, and connect these equations to their graphs and to the parent graph of a linear function.</p>	<p>6 90-min. lessons or 12 45-min. lessons</p>	<p>The student will:</p> <p>4 (45-min) Lessons: <u>Slopes of Lines</u></p> <p>Ⓐ Ⓢ ALGI.6A Develop the concept of slope as rate of change, determine slopes from graphs, tables, and algebraic representations, <i>and express slope as a ratio, decimal, or percent.</i></p> <p>Ⓐ ALGI.6B Interpret the meaning of <i>positive, negative, zero, and undefined</i> slopes and <i>x- and y-intercepts</i> in situations using data, symbolic representations, or graphs.</p> <p>Ⓢ ALGI.6E Determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations.</p> <p>Ⓐ ALGI.6F Interpret and predict the effects of changing slope and y-intercept in applied situations <i>using tabular, graphical, symbolic, and written representations.</i></p> <p>-----</p> <p>8 (45-min) Lessons: <u>Characteristics of Linear Functions</u></p> <p>Ⓐ Ⓢ ALGI.2A Identify and sketch the graphs of the general forms of linear ($f(x) = x$) and quadratic ($f(x) = x^2$) parent functions, and describe the graphs verbally and in writing.</p> <p>Ⓢ ALGI.5A Determine whether or not given situations can be represented by linear functions <i>by determining finite differences and writing an algebraic representation.</i></p> <p>Ⓐ Ⓢ ALGI.5B Determine the domain and range for linear functions in given situations <i>which are represented graphically, tabularly, symbolically, verbally, and in writing.</i></p> <p>Ⓐ ALGI.5C Use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions.</p> <p>Ⓐ ALGI.6C Investigate, describe, and predict the effects of changes in <i>m</i> and <i>b</i> on the graph of $y = mx + b$.</p> <p>Ⓢ ALGI.6D Graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y-intercept <i>when given graphically, symbolically or in written representations.</i></p> <p>Ⓐ ALGI.6F Interpret and predict the effects of changing slope and y-intercept in applied situations <i>using tabular, graphical, symbolic, and written representations.</i></p> <p>Ⓐ Ⓢ ALGI.7A Analyze situations involving linear functions <i>in forms of a graph, table, equation, or verbal description in order to formulate a linear equation or inequality to solve a problem.</i></p> <p>Ⓐ ALG.7B Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities involving one or two variables.</p>	
<p>Unit 6 Linear Regression Students collect data to graph a scatterplot, analyze the correlation to write a line of best fit, and predict outcomes based on that equation.</p>	<p>2 90-min. lessons or 4 45-min. lessons</p>	<p>4 (45-min) Lessons: <u>Linear Regression</u></p> <p>Ⓐ Ⓢ ALGI.1B Gather and record data and use data sets to determine functional relationships between quantities <i>and write a general equation describing the functional relationship.</i></p> <p>Ⓢ ALGI.1C Describe functional relationships for given problem situations, and write linear equations or inequalities and quadratic equations to answer questions arising from the situation.</p> <p>Ⓐ ALGI.1E Interpret and make decisions, predictions, and critical judgments from functional relationships.</p> <p>Ⓐ ALGI.2D Collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.</p>	

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		Nov. 12 – Dec. 21, 2012	
		# of Lessons	Objectives
		The student will:	
Unit 7 Relationships in Systems of Linear Equations Students graph systems of linear equations, connect the graph to a table of values, and determine the solution.	3 90-min. lessons or 6 45-min. lessons	<u>6 (45-min) Lessons: Graphing Systems</u> Ⓐ Ⓢ ALGI.8A Analyze a problem situation that can be represented by a linear system in two unknowns, and develop a plan for solving the system using a concrete representation and linear equations. Ⓐ ALGI.8B Solve systems of linear equations using concrete models, graphs, tables, and algebraic methods (substitution and elimination). Ⓐ Ⓢ ALGI.8C Interpret and determine the reasonableness of solutions to systems of linear equations.	

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4th	Six Weeks	33 Days	The recommended number of lessons is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.
		Jan. 8 – Feb. 22, 2013	
		# of Lessons	Objectives
Unit 8 Systems of Linear Equations and Inequalities Students solve systems of linear equations and inequalities using algebraic and graphical methods. They also explore real-world connections to graphs and tables.		5 90-min. lessons or 10 45-min. lessons	10 (45-min) Lessons: Solving Systems Ⓡ ALG.7B Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities involving one or two variables. Ⓡ Ⓢ ALGI.7C Interpret and determine the reasonableness of solutions to linear equations and inequalities. Ⓡ Ⓢ ALGI.8A Analyze a problem situation that can be represented by a linear system in two unknowns, and develop a plan for solving the system using a concrete representation and linear equations. Ⓡ ALGI.8B Solve systems of linear equations using concrete models, graphs, tables, and algebraic methods (substitution and elimination). Ⓡ Ⓢ ALGI.8C Interpret and determine the reasonableness of solutions to systems of linear equations.
Unit 9 Patterns in Polynomials and Exponents Students perform operations with polynomials and exponents and apply these operations to real-world situations.		4 90-min. lessons or 8 45-min. lessons	8 (45-min) Lessons: Properties of Exponents Ⓢ ALGI.3A Use manipulatives, drawings, verbal descriptions and symbols to represent unknowns and variables in real-world situations. Ⓡ ALGI.4A Find specific function values; add, subtract, multiply, or divide to simplify polynomial expressions; transform and solve equations including factoring as necessary in problem situations which are expressed in verbal, algebraic, or pictorial (algebra tiles) representations. Ⓢ ALGI.11A Use patterns to generate properties of exponents and apply these properties in problem-solving situations when given like numerical or variable bases and integer exponents.
Unit 10 Patterns in Quadratic Functions Students analyze patterns to identify and write equations for quadratic functions. Students also make connections between the quadratic function equation and transformations to its graph.		4 90-min. lessons or 8 45-min. lessons	8 (45-min) Lessons: Quadratic Functions Ⓡ ALGI.1D Represent relationships among quantities by using and building concrete models, completing tables, constructing graphs or diagrams, writing verbal descriptions, and writing equations and inequalities. Ⓡ Ⓢ ALGI.2A Identify and sketch the graphs of the general forms of linear ($f(x) = x$) and quadratic ($f(x) = x^2$) parent functions, and describe the graphs verbally and in writing. Ⓡ Ⓢ ALGI.3B Look for patterns in finite differences, determine the value of the zero term, and write the algebraic representation for the given situation. Ⓢ ALGI.9A Determine the domain and range for quadratic functions from graphic, tabular, symbolic, verbal, and written representations. Ⓢ ALGI.9B Investigate, describe, and predict the effects of changes in a on the graph of $y = ax^2 + c$. Ⓢ ALGI.9C Investigate, describe, and predict the effects of changes in c on the graph of $y = ax^2 + c$. Ⓡ ALGI.9D Analyze maximum or minimum points, direction of opening, symmetry, and x - and y -intercepts of graphs of quadratic functions and draw conclusions from the graph and analysis.

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5th	Six Weeks	29 Days	<i>The recommended number of lessons is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.</i>
	Feb. 25 – April 12, 2013		
		# of Lessons	Objectives
Unit 11 More Patterns in Quadratic Functions Students connect aspects of quadratic functions to their algebraic, tabular, graphical, and concrete representations. Students apply binomial multiplication, factoring, and solving quadratics to the concepts of perimeter and area.	8 90-min. lessons or 16 45-min. lessons	6 (45-min) Lessons: Multiple Representations of Multiplying Binomials and Factoring Quadratics Ⓡ ALGI.4A Find specific function values; <i>add, subtract, multiply, or divide</i> to simplify polynomial expressions; transform and solve equations <i>including</i> factoring as necessary in problem situations <i>which are expressed in verbal, algebraic, or pictorial (algebra tiles) representations.</i> Ⓡ ALGI.10A Solve quadratic equations <i>in applied settings</i> using concrete models, tables, graphs, and algebraic methods <i>including factoring and the quadratic formula.</i> Ⓢ ALGI.10B Make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function <i>using graphs, tables, or algebraic expressions.</i>	
			----- 10 (45-min) Lessons: Solving Quadratic Equations Ⓡ ALGI.1E Interpret and make decisions, predictions, and critical judgments from functional relationships. Ⓡ ALGI.4A Find specific function values; <i>add, subtract, multiply, or divide</i> to simplify polynomial expressions; transform and solve equations <i>including</i> factoring as necessary in problem situations <i>which are expressed in verbal, algebraic, or pictorial (algebra tiles) representations.</i> Ⓡ ALGI.9D Analyze <i>maximum or minimum points, direction of opening, symmetry, and x- and y-intercepts</i> of graphs of quadratic functions and draw conclusions <i>from the graph and analysis.</i> Ⓡ ALGI.10A Solve quadratic equations <i>in applied settings</i> using concrete models, tables, graphs, and algebraic methods <i>including factoring and the quadratic formula.</i> Ⓢ ALGI.10B Make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function <i>using graphs, tables, or algebraic expressions.</i>
Unit 12 Patterns of Growth and Decay in Exponential Functions and Inverse Variation Students use data to apply exponential functions and inverse variation to real-world situations.	4 90-min. lessons or 8 45-min. lessons	8 (45-min) Lessons: Multiple Representations of Growth and Decay Ⓡ ALGI.2B Identify mathematical domains and ranges and determine reasonable domain and range values for given situations, <i>represented by</i> continuous or discrete data. Ⓡ ALGI.2D Collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations. Ⓢ ALGI.11A Use patterns to generate <i>properties</i> of exponents and apply these <i>properties</i> in problem-solving situations <i>when given like numerical or variable bases and integer exponents.</i> Ⓡ Ⓢ ALGI.11B Analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods. Ⓢ ALGI.11C Analyze data, <i>and identify</i> and represent situations involving exponential growth and exponential decay using concrete models, tables, graphs, or algebraic methods.	

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6th	Six Weeks	38 Days	The recommended number of lessons is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.
		Apr. 15 – June 6, 2013	
		# of Lessons	Objectives
Unit 13 Readiness and Supporting Standards Review Students review relevant STAAR objectives prior to testing using appropriate problem-solving strategies and skills.		5 90-min. lessons or 10 45-min. lessons	The student will: <u>10 (45-min) Lessons: Problem Solving Techniques</u> Objectives to be covered should be based on individual student needs determined by data analysis.
Unit 14 Bridging to Algebra II and Geometry Students integrate geometric and algebraic concepts.		6 90-min. lessons or 12 45-min. lessons	<u>4 (45-min) Lessons: Equations of Parallel and Perpendicular Lines</u> Ⓐ GEOM.7B Apply slopes and equations of lines to investigate geometric relationships, including parallel lines, perpendicular lines, and special segments of triangles and other polygons. Ⓐ GEOM.7C Derive and use formulas involving <i>horizontal, vertical, and oblique distances</i> , slope, and midpoint <i>and use in context to applications of distance and midpoint formulas.</i> ----- <u>2 (45-min) Solving Equations and Inequalities</u> Ⓒ ALGII.2A Use and apply tools including factoring and properties of exponents to simplify expressions and to transform and solve equations and inequalities. ----- <u>6 (45-min) Lessons: Linear Functions</u> Ⓐ ALGII.1A Identify the mathematical domains and ranges of functions, determine reasonable domain and range values for continuous and discrete situations, <i>and describe situations given domain and range values.</i> Ⓐ ALGII.4B Extend parent functions with parameters such as a in $f(x) = a/x$ and including a in $g(x) = a[f(x)]$, k in $g(x) = f(x) + k$, and h in $g(x) = f(x - h)$, and describe the effects of the parameter changes on the graph of parent functions.