GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

NUMBER AND OPERATION (encompasses 6-8 MCA test items)			
Standard 1: Read, write, compare, classify and represent real numbers, and use them to solve problems in various contexts. (encompasses 6-8 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Classify real numbers as rational or irrational. Know that when a square root of a positive integer is not an integer, then it is irrational. Know that the sum of a rational number and an irrational number is irrational, and the product of a non-zero rational number and an irrational number is irrational. (8.1.1.1)	• Allowable notation: $\sqrt{18}$ • Vocabulary allowed in items: irrational, real, square root, radical, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 3.8 (146-149); Lesson 3.9 (150-153); Lesson 3.10 (156-159)	
Compare real numbers; locate real numbers on a number line. Identify the square root of a positive integer as an integer, or if it is not an integer, locate it as a real number between two consecutive positive integers. (8.1.1.2)	• Allowable notation: $\sqrt{18}$ • Vocabulary allowed in items: square root, radical, consecutive, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.5 (23-27); Lesson 2.5 (78-81); Lesson 3.9 (150-153)	
Determine rational approximations for solutions to problems involving real numbers. (8.1.1.3)	• Allowable notation: $\sqrt{18}$ • Vocabulary allowed in items: square root, radical, consecutive, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 6.3 (290-293); Lesson 6.4 (294-297); Lesson 6.6 (307-311); Lesson 6.7 (312-315); Lesson 6.8 (316-319); Lesson 6.9 (320-323); Lesson 6.10 (324-327); Lesson 8.5 (420-423)	
Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions. (8.1.1.4)	• Allowable notation: $-x2$, $(-x)2$, -32, (-3)2 • Expressions may be numeric or algebraic • Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 2.6 (84-87); Lesson 2.7 (88-91); Lesson 2.8 (92-95)	
Express approximations of very large and very small numbers using scientific notation; understand how calculators display numbers in scientific notation. Multiply and divide numbers expressed in scientific notation, express the answer in scientific notation, using the correct number of significant digits when physical measurements are involved. (8.1.1.5)	• Vocabulary allowed in items: scientific notation, significant digits, standard form, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 2.9 (96-99)	
District Benchmark: Compare, order and convert between fractions, decimals, and percents.	(None)	(Not yet identified)	
District Benchmark: Apply and understand order of operations.	(None)	(Not yet identified)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 24-30 MCA test items)			
Standard 1: Understand the concept of function in real-world and mathematical situations, and distinguish between linear and nonlinear functions. (encompasses 4-5 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Understand that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. Use functional notation, such as $f(x)$, to represent such relationships. (8.2.1.1)	• Vocabulary allowed in items: independent, dependent, constant, coefficient, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.7 (34-37); Lesson 1.8 (38-41); Lesson 11.1 (540-544); Lesson 12.4 (608-612); Lesson 12.5 (613-616); Lesson 12.6 (617-620); Lesson 12.7 (621-625)	
Use linear functions to represent relationships in which changing the input variable by some amount leads to a change in the output variable that is a constant times that amount. (8.2.1.2)	• Vocabulary allowed in items: independent, dependent, constant, coefficient, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.8 (38-41); Lesson 11.1 (540-544); Lesson 12.5 (613-616)	
Understand that a function is linear if it can be expressed in the form $f(x)=mx+b$ or if its graph is a straight line. (8.2.1.3)	• Vocabulary allowed in items: linear, constant, coefficient, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.1 (540-544); Lesson 11.2 (545-549); Lesson 11.3 (550-553); Lesson 11.5 (562-566)	
Understand that an arithmetic sequence is a linear function that can be expressed in the form $f(x)=mx+b$, where $x = 0, 1, 2, 3,\ldots$ (8.2.1.4)	• Vocabulary allowed in items: *n*th term, arithmetic sequence, geometric sequence, linear function, non-linear function, progression, common difference, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 12.1 (590-594)	
Understand that a geometric sequence is a non-linear function that can be expressed in the form $f(x)=ab^x$, where $x = 0, 1, 2, 3,\ldots$ (8.2.1.5)	• Vocabulary allowed in items: *n*th term, arithmetic sequence, geometric sequence, linear function, non-linear function, exponential, progression, common ratio, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 12.2 (595-599)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 24-30 MCA test items) (continued)			
Standard 2: Recognize linear functions in real-world and mathematical situations; represent linear functions and other functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions and explain results in the original context. (encompasses 4-6 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. (8.2.2.1)	• Vocabulary allowed in items: linear function, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.7 (34-37); Lesson 1.8 (38-41); Lesson 11.1 (540-544); Lesson 11.3 (550-553); Lesson 11.4 (556-559)	
Identify graphical properties of linear functions including slopes and intercepts. Know that the slope equals the rate of change, and that the *y*-intercept is zero when the function represents a proportional relationship. (8.2.2.2)	• Coordinates used for determining slope must contain integer values • Vocabulary allowed in items: linear function, intercept, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.2 (545-549); Lesson 11.3 (550-553)	
Identify how coefficient changes in the equation $f(x) = mx + b$ affect the graphs of linear functions. Know how to use graphing technology to examine these effects. (8.2.2.3)	• Vocabulary allowed in items: linear function, intercept, coefficient, constant, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.3 (550-553)	
Represent arithmetic sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems. (8.2.2.4)	• Vocabulary allowed in items: *n*th term, arithmetic sequence, geometric sequence, linear function, non-linear function, progression, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 12.1 (590-594)	
Represent geometric sequences using equations, tables, graphs and verbal descriptions, and use them to solve problems. (8.2.2.5)	• Vocabulary allowed in items: *n*th term, arithmetic sequence, geometric sequence, linear function, non-linear function, progression, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 12.2 (595-599)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 24-30 MCA test items) (continued)			
Standard 3: Generate equivalent numerical and algebraic expressions and use algebraic properties to evaluate expressions. (encompasses 3-5 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Evaluate algebraic expressions, including expressions containing radicals and absolute values, at specified values of their variables. (8.2.3.1)	• Items must not have context • Directives may include: simplify, evaluate • Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.1 (4-7); Lesson 2.6 (84-87); Lesson 3.1 (112-116); Lesson 3.8 (146-149); Lesson 3.9 (150-153); Lesson 3.10 (156-159)	
Justify steps in generating equivalent expressions by identifying the properties used, including the properties of algebra. Properties include the associative, commutative and distributive laws, and the order of operations, including grouping symbols. (8.2.3.2)	• Items must not have context • Vocabulary allowed in items: associative, commutative, distributive, identity, property, order of operations, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.1 (4-5); Lesson 1.6 (28-29); Lesson 2.3 (68-69); Lesson 2.6 (84-85); Lesson 13.2 (650-651)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 24-30 MCA test items) (continued)			
Standard 4: Represent real-world and mathematical situations using equations and inequalities involving linear expressions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context. (encompasses 10-15 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Use linear equations to represent situations involving a constant rate of change, including proportional and non-proportional relationships. (8.2.4.1)	• Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 7.4 (356-359); Lesson 7.7 (372-375); Lesson 7.8 (376-379); Lesson 7.9 (382-385); Lesson 11.5 (562-566)	
Solve multi-step equations in one variable. Solve for one variable in a multi-variable equation in terms of the other variables. Justify the steps by identifying the properties of equalities used. (8.2.4.2)	• Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 10.1 (498-501); Lesson 10.2 (502-505); Lesson 10.3 (507-511); Lesson 10.5 (519-522)	
Express linear equations in slope-intercept, point-slope and standard forms, and convert between these forms. Given sufficient information, find an equation of a line. (8.2.4.3)	• Items must not have context • Vocabulary allowed in items: slope-intercept form, point-slope form, standard form, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.3 (550-554); Lesson 11.4 (556-559)	
Use linear inequalities to represent relationships in various contexts. (8.2.4.4)	• Inequalities contain no more than 1 variable • Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.5 (23-27); Lesson 2.5 (78-81); Lesson 10.4 (514-518); Lesson 11.6 (567-571)	
Solve linear inequalities using properties of inequalities. Graph the solutions on a number line. (8.2.4.5)	• Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 1.5 (23-27); Lesson 2.5 (78-81); Lesson 10.4 (514-518)	
Represent relationships in various contexts with equations and inequalities involving the absolute value of a linear expression. Solve such equations and inequalities and graph the solutions on a number line. (8.2.4.6)	• Vocabulary allowed in items: vocabulary given at previous grades	(None identified)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

ALGEBRA (encompasses 24-30 MCA test items) (continued)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Represent relationships in various contexts using systems of linear equations. Solve systems of linear equations in two variables symbolically, graphically and numerically. (8.2.4.7)	• Vocabulary allowed in items: system of equations, undefined, infinite, intersecting, identical, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 10.6 (523-527)	
Understand that a system of linear equations may have no solution, one solution, or an infinite number of solutions. Relate the number of solutions to pairs of lines that are intersecting, parallel or identical. Check whether a pair of numbers satisfies a system of two linear equations in two unknowns by substituting the numbers into both equations. (8.2.4.8)	• Assessed within 8.2.4.7	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 10.6 (523-527)	
Use the relationship between square roots and squares of a number to solve problems. (8.2.4.9)	• Allowable notation: ± 3 • Items may assess the interpretation of square roots based on the context of the item • Vocabulary allowed in items: square root and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 3.8 (146-149); Lesson 3.9 (150-153); Lesson 6.3 (290-293); Lesson 10.5 (520)	
District Benchmark: Practice adding and subtracting of polynomials.	(None)	(Not yet identified)	
District Benchmark: Create a table and graph of a quadratic function.	(None)	(Not yet identified)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

GEOMETRY AND MEASUREMENT (encompasses 8-10 MCA test items)			
Standard 1: Solve problems involving right triangles using the Pythagorean Theorem and its converse. (encompasses 3-5 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Use the Pythagorean Theorem to solve problems involving right triangles. (8.3.1.1)	• Congruent angle marks may be used • Vocabulary allowed in items: Pythagorean Theorem and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 6.3 (290-293)	
Determine the distance between two points on a horizontal or vertical line in a coordinate system. Use the Pythagorean Theorem to find the distance between any two points in a coordinate system. (8.3.1.2)	• Graphs are not provided when finding horizontal or vertical distance • Vocabulary allowed in items: Pythagorean Theorem and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 6.3 (290-293)	
Informally justify the Pythagorean Theorem by using measurements, diagrams and computer software. (8.3.1.3)	(Not assessed on the MCA-III)	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 6.3 (290-293)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

GEOMETRY AND MEASUREMENT (encompasses 8-10 MCA test items) (continued)			
Standard 2: Solve problems involving parallel and perpendicular lines on a coordinate system. (encompasses 3-5 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Understand and apply the relationships between the slopes of parallel lines and between the slopes of perpendicular lines. Dynamic graphing software may be used to examine these relationships. (8.3.2.1)	• Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.2 (545-549)	
Analyze polygons on a coordinate system by determining the slopes of their sides. (8.3.2.2)	• Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 5.5 (244-247)	
Given a line on a coordinate system and the coordinates of a point not on the line, find lines through that point that are parallel and perpendicular to the given line, symbolically and graphically. (8.3.2.3)	• Vocabulary allowed in items: vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.2 (545-549)	
District Benchmark: Use formulas to calculate perimeter, area, and volume of two- and three-dimensional figures.	(None)	(Not yet identified)	
District Benchmark: Identify and classify angles and polygons. Understand similar and congruent and similar figures	(None)	(Not yet identified)	
District Benchmark: Apply transformation – translations, reflection, rotations, dilations.	(None)	(Not yet identified)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

DATA ANALYSIS AND PROBABILITY (encompasses 6-8 MCA test items)			
Standard 1: Interpret data using scatterplots and approximate lines of best fit. Use lines of best fit to draw conclusions about data. (encompasses 6-8 MCA test items)			
Curriculum Benchmark	**MCA III Test Item Specifications**	**Where Benchmark is Taught/Assessed in Holt "Pre-Algebra" Student Edition**	**Notes**
Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit and determine an equation for the line. Use appropriate titles, labels and units. Know how to use graphing technology to display scatterplots and corresponding lines of best fit. (8.4.1.1)	• Data sets are limited to no more than 30 data points • Vocabulary allowed in items: scatterplot, line of best fit, correlation and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 4.7 (204-207); Lesson 11.7 (572-575)	
Use a line of best fit to make statements about approximate rate of change and to make predictions about values not in the original data set. (8.4.1.2)	• Vocabulary allowed in items: scatterplot, line of best fit, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 11.7 (572-575)	
Assess the reasonableness of predictions using scatterplots by interpreting them in the original context. (8.4.1.3)	• Vocabulary allowed in items: scatterplot, line of best fit, and vocabulary given at previous grades	Holt "Pre-Algebra" 2004/2006 SE pages: Lesson 4.7 (204-207)	
District Benchmark: Predict possible outcomes using probability and odds.	(None)	(Not yet identified)	
District Benchmark: Identify and use measures of central tendency, range, outliers, and quartiles of a set of data. Create and interpret box-and-whisker plots.	(None)	(Not yet identified)	
District Benchmark: Use Venn Diagrams.	(None)	(Not yet identified)	

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

READING IN THE CONTENT AREA (Taken from "Standards for Literacy in Science/Technical Subjects")				
Benchmark	**Unit**	**Quarter**	**Activities**	**How Assessed**
Cite specific textual evidence to support analysis of technical texts. (6.13.1.1)	All units involve analyzing word problems. Specifically Chapter 6 Systems.	Ongoing. Specifically Systems is Quarter 3.	Analyze the usefulness or effectiveness of a word problem.	Through application of standard in the problems assigned – formative and summative on Chapter 6 test.
Determine the central ideas or conclusions of a text; provide an accurate summary of the txt distinct from prior knowledge or opinions. (6.13.2.2)	All units involve analyzing word problems. Specifically in Chapter 3 Inequalities.	Ongoing. Specifically Inequalities is Quarter 2.	Solving word problems. Being able to pick key words in order to determine the mathematical structure of the problem.	Through application of standard in the problems assigned – formative and summative on Chapter 3 test.
Follow precisely a multistep procedure when carrying out experiments, designing solutions, taking measurements, or performing technical tasks. (6.13.3.3)	Solving Multistep Equations Section 2-4 and Multistep Inequalities Section 3-4.	Ongoing. Specifically is Quarter 2 for equations and Quarter 3 for inequalities.	Our students have to follow multistep procedures in many applications including order of Operations, Volume, and Surface area, Systems of equations.	Through application of standard in the problems assigned – formative and summative on Chapter 2 and 3 test.
Determine the meaning of symbols, equations, graphic representations, tabular representations, key terms, and other domain-specific word and phrases as they are used in a specific technical context relevant to grades 6-8 texts and topics (6.13.4.4)	All units address this benchmark. Specifically Chapter 1 translating words to expressions and vice versa.	Ongoing. Specifically Translating is Quarter 1.	Variables, =, <, > operations and grouping symbols	Through application of standard in the problems assigned – formative and summative on Chapter 1 test.
Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic. (6.13.5.5)	Chapter 1	Specifically Systems is Quarter 1	We introduce students to the book by having activities such as Scavenger hunt.	Through application of standard in the problems assigned – formative.
Analyze the author's purpose in describing phenomena, providing an explanation, describing a procedure, or discussing/reporting an experiment in a text. (6.13.6.6)	Scatterplots and Trend Lines Section 4-5	Ongoing. Specifically analyzing lines is Quarter 2.	Analyzing trend lines, correlations, and making lines of best fit.	Through application of standard in the problems assigned – formative and summative on Chapter 4 test.
Compare and integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, table, map). (6.13.7.7)	Graphing Functions Chapter 5	Quarter 2	We use diagrams, tables and graphs in almost every unit; specifically in chapter 5 linear equations we make graphs throughout this chapter.	Through application of standard in the problems assigned –formative and summative on Chapter 5 test.
Distinguish among claims, evidence, reasoning, facts and reasoned judgment based on research findings, and speculation in a text. (6.13.8.8)	Graphing Functions Chapter 5	Quarter 2	We use diagrams, tables and graphs in almost every unit; specifically in chapter 5 linear equations we make graphs throughout this chapter.	Through application of standard in the problems assigned –formative and summative on Chapter 5 test.

GRADE 8: ALGEBRA BASICS CURRICULUM FRAMEWORKS

READING IN THE CONTENT AREA (Taken from "Standards for Literacy in Science/Technical Subjects") (continued)				
Benchmark	**Unit**	**Quarter**	**Activities**	**How Assessed**
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with what has been gained from reading a text on the same topic. (6.13.9.9)	Chapter 1	Quarter 1	Equation solving, flow chart, Venn diagram (GCF, LCD and LCM).	Through application of standard in the problems assigned – formative.
By the end of grade 8, read and comprehend technical texts in the grades 6-8 text complexity band independently and proficiently. (6.13.10.10)	All units	All Quarters	Having students read and use their text.	Through application of standard in the problems assigned – formative.