Algebra I Honors K

Curriculum Guide

Dunmore School District

Dunmore, PA

Algebra I Honors K

Prerequisite:

- Successful completion of Pre-Algebra Honors

Algebra I Honors K is intended to challenge the higher performing student. This course parallels the topics covered in Algebra I, but differs from in Algebra I in depth, breadth and pace, in addition to more focus on application problems. Eighth grade PSSA topics are also be included in this course.

At the culmination of this course, the students will sit for the Keystone Algebra I Exam. After successfully completing this course, students who meet the proper prerequisites will be enrolled in Honors Geometry.

Dunmore School District
Curriculum Guide

Year-at-a-glance

Subject: Algebra I Honors K	Grade Level: 8	Date Completed: 6/07/2017

1st Quarter

Topic	Resources	Standards
Real Numbers	**Worksheets**	**A1.1.1.1** **CC.2.1.8.E.1, CC.2.1.8.E.4, CC.2.1.HS.F.1, CC.2.1.HS.F.2** **A1.1.1.1.1**
Equations	**Algebra 1** **Chapter 1: 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9**	**A1.1.2.1, CC.2.1.HS.F.3** **CC.2.1.HS.F.4, CC.2.1.HS.F.5, CC.2.2.8.B.3, CC.2.2.8.C.1, CC.2.2.8.C.2, CC.2.2.HS.C.3, CC.2.2.HS.D.8, CC.2.2.HS.D.9, CC.2.2.HS.D.10, A1.1.2.1.1, A1.1.2.1.2, A1.1.2.1.3**
Inequalities	**Algebra 1** **Chapter 2:** **2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7**	**A1.1.3.1, CC.2.1.HS.F.5, CC.2.2.HS.D.7, CC.2.2.HS.D.9, CC.2.2.HS.D.10, A1.1.3.1.1, A1.1.3.1.2, A1.1.3.1.3**

2nd Quarter

Topic	Resources	Standards
Functions	**Algebra 1** **Chapter 3:** **3-1, 3-2, 3-3, 3-4, 3-5, 3-6**	**A1.2.1.1, CC.2.2.8.C.1, CC.2.2.8.C.2, CC.2.2.HS.C.2, CC.2.2.HS.C.1, CC.2.2.HS.C.3, CC.2.4.HS.B.2, A1.2.1.1.1, A1.2.1.1.2, A1.2.1.1.3**
Linear Functions	**Algebra 1** **Chapter 4:** **4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10**	**A1.1.2.1, A1.2.2.2, A1.2.2.2, CC.2.1.HS.F.3, CC.2.1.HS.F.4**
Systems of Equations and Inequalities	**Algebra 1** **Chapter 5:** **5-1, 5-2, 5-3,5-4, 5-5, 5-6**	**CC.2.1.HS.F.5, CC.2.2.HS.D.7, CC.2.2.HS.D.10, A1.1.3.2**

3rd Quarter

Topic	Resources	Standards
Exponents and Polynomials	**Algebra 1** **Chapter 6:** **6-1, 6-2, 6-3, 6-4, 6-5, 6-6**	**A1.1.1.5, CC.2.2.HS.D.1, CC.2.2.HS.D.2, CC.2.2.HS.D.3**
PSSA Preparation	**Perfection Learning** **Common Core Mathematics Standards PSSA Workbook** **Worksheets**	**M08.C-G.1.1, M08.C-G.2.1, M08.C-G.3.1, M08.D-S.1.1, A1.2.3.1, A1.2.3.2, A1.2.3.3, A1.2.2.2, CC.2.4.HS.B.1, CC.2.4.HS.B.3, CC.2.4.HS.B.5, CC.2.4.7.B.3, CC.2.4.HS.B.4, CC.2.2.HS.C.6, CC.2.4.HS.B.7, CC.2.4.8.B.1, CC.2.4.HS.B.2, CC.2.4.HS.B.3, A1.2.3.1.1, A1.2.3.2.1, A1.2.3.2.2, A1.2.3.2.3, A1.2.3.3.1, A1.2.2.2.1**

4th Quarter

Topic	Resources	Standards
Factoring Polynomials	**Algebra 1** **Chapter 7:** **7-1, 7-2, 7-3, 7-4, 7-5, 7-6** **Keystone Finish Line Workbook Algebra 1** **Keystone Review Packets**	**A1.1.1.2, A1.1.1.5,** **CC.2.2.HS.D.5, CC.2.2.HS.D.6**
Quadratics	**Algebra 1** **Chapter 8:** **8-1, 8-2, 8-3, 8-5, 8-6, 8-7, 8-8**	**CC.2.1.HS.F.7, CC.2.1.HS.F.7,** **CC.2.2.HS.D.5**
Review and Final Exam	**Text Book** **Review Packets**	

General Topic	Anchor Descriptor PA Core Standards	Eligible Content, Essential Knowledge, Skills & Vocabulary	Resources & Activities	Assessments	Suggested Time (In Days)
Real Numbers	**A1.1.1.1 Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).** **CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties.** **CC.2.1.8.E.4 Estimate irrational numbers by comparing them to rational numbers.** **CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents.** **CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real-world or mathematical problems.**	**A1.1.1.1.1 Compare and/or order any real numbers. Note: Rational and irrational may be mixed.** **Vocabulary:** • **Rational Number** • **Irrational Number**	**Approved textbook** **Worksheets**	**Teacher prepared tests, quizzes, etc.**	**15 days**
Equations	**A1.1.2.1 Write, solve, and/or graph linear equations using various methods.** **CC.2.1.HS.F.3 Apply quantitative reasoning to**	**A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations).** **A1.1.2.1.2 Use and/or**	**Algebra 1** **Chapter 1: 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9**	**Teacher prepared tests, quizzes, etc.**	**15 days**

	choose and interpret units and scales in formulas, graphs, and data displays. **CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.** **CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.** **CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.** **CC.2.2.8.C.1 Define, evaluate, and compare functions.** **CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities.** **CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.** **CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.**	**identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only.** **A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.** **Vocabulary:** • **Constant** • **Expression** • **Order of Operations** • **Variable** • **Evaluate** • **Solution** • **Formula** • **Ratio** • **Proportion** • **Unit Rate** • **Rate** • **Scale Drawing** • **Scale Model** • **Similar** • **Corresponding Sides** • **Corresponding Angles** • **Scale Factor**			

	CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. **CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**				
Inequalities	**A1.1.3.1 Write, solve, and/or graph linear inequalities using various methods.** **CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.** **CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.** **CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.** **CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**A1.1.3.1.1 Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).** **A1.1.3.1.2 Identify or graph the solution set to a linear inequality on a number line.** **A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear inequalities only.** **Vocabulary:** • **Inequality** • **Compound Inequality** • **Intersection** • **Union** • **Absolute Value**	**Algebra 1** **Chapter 2:** **2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7**	**Teacher prepared tests, quizzes, etc.**	**15 days**

Functions	**A1.2.1.1 Analyze and/or use patterns or relations.** **CC.2.2.8.C.1 Define, evaluate, and compare functions.** **CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities.** **CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.** **CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.** **CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.** **CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.**	**A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.** **A1.2.1.1.2 Determine whether a relation is a function, given a set of points or a graph.** **A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).** **Vocabulary:** • **Continuous Graph** • **Discrete Graph** • **Relation** • **Domain** • **Range** • **Function** • **Independent Variable** • **Dependent Variable** • **Function Rule** • **Function Notation** • **Scatter Plots** • **Correlation** • **Positive Correlation** • **Negative Correlation** • **Trend Line** • **Sequence** • **Term** • **Common Difference** • **Arithmetic Sequence**	**Algebra 1** **Chapter 3:** **3-1, 3-2, 3-3, 3-4, 3-5, 3-6**	**Teacher prepared tests, quizzes, etc.**	**15 days**

Linear Functions	**A1.1.2.1 Write, solve, and/or graph linear equations using various methods.** **A1.2.2.2 Analyze and/or interpret data on a scatter plot** **A1.2.2.2 Analyze and/or interpret data on a scatter plot** **A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations).** **CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.** **CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.** **CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.** **CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.**	**A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations)** **A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only.** **A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear equations only** **A1.2.1.2.1 Create, interpret, and/or use the equation, graph, or table of a linear function.** **A1.2.2.1.1 Identify, describe, and/or use constant rates of change** **A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems.** **A1.2.2.1.3 Write or identify a linear equation when given** **• the graph of the line** **• two points on the line, or** **• the slope and a point on the line.** **Note: Linear equation may be**	**Algebra 1** **Chapter 4:** **4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10**	**Teacher prepared tests, quizzes, etc.**	**15 days**

	CC.2.2.8.C.1 Define, evaluate, and compare functions. **CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities.** **CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.** **CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.** **CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.** **CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.** **CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**in point-slope, standard, and/or slope-intercept form.** **A1.2.2.1.4 Determine the slope and/or y-intercept represented by a linear equation or graph.** **A1.2.2.2.1 Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot** **Vocabulary:** • **Linear Function** • **Linear Equation** • **X-Intercept** • **Y-Intercept** • **Rate of Change** • **Slope** • **Direct Variation** • **Constant of Variation** • **Slope-Intercept Form** • **Point-Slope Form** • **Line of Best Fit** • **Parallel Lines** • **Perpendicular Lines** • **Family of Functions** • **Parent Function** • **Transformation** • **Translation** • **Rotation** • **Reflection**			

Systems of Equations and Inequalities	**A1.1.3.2 Write, solve, and/or graph systems of linear inequalities using various methods.** **CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.** **CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.** **CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.**	**A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination. Note: Limit systems to two linear equations.** **A1.1.3.2.1 Write and/or solve a system of linear inequalities using graphing. Note: Limit systems to two linear inequalities** **A1.1.3.2.2 Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear inequalities** **Vocabulary:** • **System of Linear Equation** • **Solution of a System of Linear** • **Equations** • **Consistent System** • **Inconsistent System** • **Independent System** • **Dependent System** • **Linear Inequality**	**Algebra 1** **Chapter 5:** **5-1, 5-2, 5-3, 5-4, 5-5, 5-6**	**Teacher prepared tests, quizzes, etc.**	**15 days**

		• Solution of a Linear • Inequality • System of Linear • Inequalities • Solutions of a System • Of Linear Inequalities			
Exponents and Polynomials	**A1.1.1.5 Simplify expressions involving polynomials.** **CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context.** **CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems.** **CC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.**	**A1.1.1.5.1 Add, subtract, and/or multiply polynomial expressions (express answers in simplest form). Note: Nothing larger than a binomial multiplied by a trinomial.** **Vocabulary:** • Index • Monomial • Degree of a Monomial • Polynomial • Degree of a Polynomial • Standard Form of a • Polynomial • Leading Coefficient • Perfect-Square Trinomial • Difference of Two Squares	**Algebra 1** **Chapter 6:** **6-1, 6-2, 6-3, 6-4, 6-5, 6-6**	**Teacher prepared tests, quizzes, etc.**	**15 days**

PSSA Preparation	**M08.C-G.1.1 Apply properties of geometric transformations to verify congruence or similarity.** **M08.C-G.2.1 Solve problems involving right triangles by applying the Pythagorean theorem.** **M08.C-G.3.1 Apply volume formulas of cones, cylinders, and spheres.** **M08.D-S.1.1 Analyze and interpret bivariate data displayed in multiple representations.** **A1.2.3.1 Use measures of dispersion to describe a set of data.** **A1.2.3.2 Use data displays in problem solving settings and/or to make predictions.** **A1.2.3.3 Apply probability to practical situations.** **A1.2.2.2 Analyze and/or interpret data on a scatter plot.** **CC.2.4.HS.B.1 Summarize, represent, and interpret data**	**M08.C-G.1.1.1 Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations.** **M08.C-G.1.1.2 Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them.** **M08.C-G.1.1.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.** **M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.** **M08.C-G.2.1.1 Apply the converse of the Pythagorean theorem to show a triangle is a right triangle.** **M08.C-G.2.1.2 Apply the**	**Perfection Learning Common Core Mathematics Standards PSSA Workbook** **Worksheets**	**Teacher prepared tests, quizzes, etc.**	**30 days**

	on a single count or measurement variable. **CC.2.4.HS.B.3 Analyze linear models to make interpretations based on the data.** **CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies** **CC.2.4.7.B.3 Investigate chance processes and develop, use, and evaluate probability models.** **CC.2.4.HS.B.4 Recognize and evaluate random processes underlying statistical experiments.** **CC.2.4.HS.B.7 Apply the rules of probability to compute probabilities of compound events in a uniform probability model.** **CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.**	**Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Figures provided for problems in three dimensions will be consistent with Eligible Content in grade 8 and below.)** **M08.C-G.2.1.3 Apply the Pythagorean theorem to find the distance between two points in a coordinate system** **M08.C-G.3.1.1 Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. Formulas will be provided.** **M08.D-S.1.1.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative correlation, linear**			

	CC.2.4.8.B.1 Analyze and/or interpret bivariate data displayed in multiple representations. **CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.** **CC.2.4.HS.B.3 Analyze linear models to make interpretations based on the data.**	**association, and nonlinear association.** **M08.D-S.1.1.2 For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.** **M08.D-S.1.1.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. Example: In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.** **A1.2.3.1.1 Calculate and/or interpret the range, quartiles, and interquartile range of data.** **A1.2.3.2.1 Estimate or calculate to make predictions based on a circle,**			

		line, bar graph, measure of central tendency, or other representation. **A1.2.3.2.2 Analyze data, make predictions, and/or answer questions based on displayed data (box-and whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).** **A1.2.3.2.3 Make predictions using the equations or graphs of best-fit lines of scatter plots.** **A1.2.3.3.1 Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent.** **A1.2.2.2.1 Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.**			

Factoring Polynomials	**A1.1.1.2 Apply number theory concepts to show relationships between real numbers in problem-solving settings.** **A1.1.1.5 Simplify expressions involving polynomials.** **CC.2.2.HS.D.5 Use polynomial identities to solve problems.** **CC.2.2.HS.D.6 Extend the knowledge of rational functions to rewrite in equivalent forms.**	**A1.1.1.2.1 Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.** **A1.1.1.5.1 Add, subtract, and/or multiply polynomial expressions (express answers in simplest form). Note: Nothing larger than a binomial multiplied by a trinomial.** **A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials.** **Note: Trinomials are limited to the form ax2 + bx + c where a is equal to 1 after factoring out all monomial factors.** **A1.1.1.5.3 Simplify/reduce a rational algebraic expression.** **Vocabulary:** • **Prime Factorization** • **Greatest Common Factor**	**Algebra 1** **Chapter 7:** **7-1, 7-2, 7-3, 7-4, 7-5, 7-6** **Keystone Finish Line Workbook Algebra 1** **Keystone Review Packets**	**Teacher prepared tests, quizzes, etc.**	**27 days**

Quadratics	**CC.2.1.HS.F.7 Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.** **CC.2.1.HS.F.7 Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.** **CC.2.2.HS.D.5 Use polynomial identities to solve problems.**	**A2.2.1.1.1, A2.2.1.1.2, A2.2.1.1.3, A2.2.1.1.4** **A2.2.1.1.1, A2.2.1.1.2, A2.2.1.1.3, A2.2.1.1.4** **A1.1.1.5.1, A1.1.1.5.2, A1.1.1.5.3, A2.1.2.2.1, A2.1.2.2.2, A2.1.3.1.1, A2.1.3.1.2, A2.1.3.1.3, A2.1.3.1.4** **Vocabulary:** • **Quadratic Function** • **Parabola** • **Vertex** • **Minimum Value** • **Maximum Value** • **Axis of Symmetry** • **Zero of a Function** • **Quadratic Equation** • **Completing the Square**	**Algebra 1** **Chapter 8:** **8-1, 8-2, 8-3, 8-5, 8-6, 8-7, 8-8**	**Teacher prepared tests, quizzes, etc.**	**3 days**
Review and Final Exam		**Text Book** **Worksheet Packets**			**15 days**