

**Practical Algebra A/I and B/II Curriculum  
Crawford Central School District**

**Practical Algebra A/I (Year 1)**

Scope and Sequence	Concept	Competency	Acceleration	Vocabulary	Strategy	PA Core State Standards	PA Academic Standards	Larson Resources Algebra I
Essential Question	<i>How is mathematics used to quantify, compare, represent, and model numbers?</i>							
Open Ended Task	<i>Reference Problem #24 on page 269 from Keystone Coach Algebra I. Edit part C to classify numbers as rational or irrational.</i>							
2-3 weeks (Sept)	<i>Represent and/or use numbers in equivalent forms</i>	All operations of sign numbers		Rational and irrational Numbers, Square roots, powers, exponents, radicals, scientific notation	Stress the sign rules and practices	CC.2.1.HS.F.1, CC.2.1.HS.F.2	2.1.A1.A	1.2, 2.1
		Identify rational or irrational numbers			Charateristics of rational vs. irrational	CC.2.1.HS.F.2	2.1.A1.A	2.1
		Compare/Order any real numbers (rational and irrational)			Placement on number lines of all number forms	CC.2.1.HS.F2	2.1.A1.A	2.1
		Simplify Square Roots (perfect squares)			Estimating square roots	CC.2.1.HS.F.2	2.1.A1.A	2.1
Essential Question	<i>How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?</i>							
Open Ended Task	<i>Reference Problem #24 on page 239 from Keystone Coach Algebra I. Edit to have one of the sides of the rectangle be a constant to avoid a polynomial expression.</i>							
8-10 weeks (Sept-Nov)	<i>Solve linear equations using various methods.</i>	Use and/or identify an algebraic property to justify any step in an equation-solving process	Justify steps to proofs using the properties	All properties of equality, addition and multiplication, distributive property, inverse	Solving equations and justifying each step in the process using properties of equality.	CC.2.2.HS.D.9, CC.2.2.HS.D.8	2.1.A1.F, 2.8.A1.E, 2.8.A1.F	1.1, 2.2 to 2.5
		Interpret solutions to problems in the context of the problem situation			Stressing the properties used to solve the application of the equation, stress answering the question posed to you	CC.2.2.HS.D.9, CC.2.2.HS.D.10, CC.2.2.HS.D.8	2.8.A1.F	1.1, 2-2 to 2.5
		Proportions			Write ratios and proportions. Solve proportions using cross products.	CC.2.1.6.D.1, CC.2.1.7.D.1	2.8.A1.F	2.7

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		Literal Equation			Rewrite equations and formulas to isolate different variables.	CC.2.2.HS.D.7	2.8.A1.F	2.8
<b>Essential Question</b>	<i>How do you decide which functional representation to choose when modelling a real world situation, and how would you explain your solution to the problem?</i>							
<b>Open Ended Task</b>	<i>Reference problem #39 on page 205. Modify problem for students to generate the linear equation/function own their own using rate of change and slope intercept. Have students graph the equation, identify the domain and range, as well as evaluate the function at a certain number of years.</i>							
<b>12-16 weeks (Dec - Mar)</b>	<i>Interpret and/or use linear functions and their equations, graphs, or tables</i>	Create, interpret, and/or use the equation, graph, or table of a linear function.		Coordinate Plane, Quadrants, t-chart, ordered pairs, horizontal & vertical	Understand that there is an infinite amount of solutions to a linear	CC.9-12.F.IF.7	2.8.A1.D	3.1 - 3.3
		Find slope and rate of change		slope formula, rate of change	Rise over Run, Positive and Negative Slope, Undefined, Slope of Zero	CC.9-12.F.IF.6	2.8.A1.D	3.4
		Graph using slope-intercept		slope-intercept form, direct variation, constant of variation	$y = mx + b$ , $m = \text{slope}$ , $b = y \text{ intercept}$ ,	CC.9-12.F.IF.7a	2.8.A1.D	3.5 - 3.6
		Determine whether a relation is a function, given a set of points or a graph		Relations, functions, domain, range, Vertical Line Test, 1-to-1	Vertical Line Test, 1-to-1 Correspondence	CC.9-12.A.CED.2, CC.9-12.F.IF.4	2.8.A1.D	1.7, 1.8
		Identify the domain or range of a relation (may be presented as ordered pairs, a		Domain, range, ordered pairs, relation, function	Make the connection between x and y and domain and range in terms	CC.9-12.A.CED.2, CC.9-12.F.IF.4	2.8.A1.D	1.7, 1.8
		Linear functions		function notation		CC.9-12.F.IF.7a		3.7
<b>Essential Questions</b>	<i>How do you write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities?</i>							
<b>Open Ended Task</b>	<i>Reference problem #52 page 256 from Keyston Coach Algebra 1. Modify problem to also include parallel lines.</i>							
		Write linear equations in slope-intercept form given a graph, slope & a point, or 2				CC.9-12.A.CED.2	2.1.A1.F, 2.8.A1.E, 2.8.A1.F	4.1 & 4.2
		Write linear equations in point-slope form and standard form.			Stressing the properties used to solve the application of the	CC.9-12.A.CED.2	2.8.A1.F	4.3 & 4.4

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10-12 weeks (Apr-June)	<i>Write linear equations and functions using various methods.</i>	Write equations of parallel & perpendicular lines				CC.2.1.6.D.1, CC.2.1.7.D.1	2.8.A1.F	4.5
		Fit a line to data. (Line of best fit)		scatter plot, trend line, positive, negative, & no correlation	Drawing a line of best fit in a scatter plot, describing the correlation, generating an equation of the line of best fit (trend line), making predictions.	CC.9-12.S.ID.6c	2.6.A1.C	4.6

**Practical Algebra B/II (Year 2)**

Essential Questions	<i>How do you write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities?</i>							
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Open Ended Task	<i>Reference problem #27 page 272 Keystone Coach Algebra 1</i>							
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10-12 weeks (Sept-Nov)	<i>Solving and Graphing Linear Inequalities</i>	Solve & graph inequalities using addition, subtraction, multiplication & division.				CC.9-12.A.REI.3	2.8.A1.B, 2.8.A1.E	5.1 & 5.2
		Solve & graph compound inequalities				CC.9-12.A.REI.3	2.8.A1.B, 2.8.A1.E	5.3
		Graphing linear inequalities in two variables				CC.9-12.A.REI.12	2.8.A1.B, 2.8.A1.E	5.7

Essential Questions	<i>How do you write, solve, and interpret systems of two linear equations and inequalities using graphing and algebraic techniques?</i>							
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Open Ended Task	<i>Reference problem #26 page 271 Keystone Coach Algebra 1</i>							
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10-12 weeks (Dec-Feb)	<i>Solving Systems of Equations &amp; Inequalities</i>	Solve linear systems by graphing				CC.9-12.A.REI.6	2.8.A1.B, 2.8.A1.E	6.1
		Solve linear systems by substitution & adding or subtracting				CC.9-12.A.REI.6	2.8.A1.B, 2.8.A1.E	6.2 & 6.3
		Solve systems of linear inequalities		boundary line, half plane, intersection, solutions of linear inequalities	identify boundary lines & half planes, locate the intersection for the solutions, check random point for solution algebraically, explain possibility of no solution	CC.9-12.A.REI.12	2.8.A1.B, 2.8.A1.E	6.6
<b>Essential Questions</b>	<i>How can data be organized and represented to provide insight into the relationship between quantities.</i>							
<b>Open Ended Task</b>	<i>Reference problem #25 page 270 Keystone Coach Algebra I</i>							
2-4 weeks (Jan)	<i>Use measures of dispersion to describe a set of data</i>	Calculate and/or interpret the range, quartiles, and interquartile range of data		Range, quartile, interquartile range, median, box and whisker plot, outliers	Median, median, median!	CC.2.4.HS.B1, CC.2.4.HS.B2	2.6.A1.C	10.1 to 10.5
		Estimate or calculate to make predictions based on a circle, line, bar graph,		Circle graph, line graph, histogram, bar graph, central tendency, mean,	Use the appropriate graph given the information provided	CC.2.4.HS.B1, CC.2.4.HS.B2, CC.2.4.HS.B5	2.6.A1.E	10.1 to 10.5

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4-6 weeks (Feb-Mar)	<i>Use data displays in problem-solving settings and/or to make predictions</i>	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)		box-and-whisker plots, stem and leaf plots, (double stem leaf), scatter plots, measures of central tendency,	Graphic Organizers	CC.2.4.HS.B1, CC.2.4.HS.B2, CC.2.4.HS.B3, CC.2.4.HS.B5	2.6.A1.E	10.1 to 10.5	
		Find probabilities for compound events (e.g. find probability of red and blue, find probability of red or		Probability, Odds, Outcomes, Dependent, independent events, Fundamental counting	Probability - desired outcome:total Odds - desired:undesired (for: against)	CC.2.4.HS.B.7, CC.2.4.HS.B.6	2.7.A1.A	11.1 to 11.5	
Essential Questions	<i>How is mathematics used to quantify, compare, represent, and model numbers?</i>								
Open Ended Task	<i>Reference problem #25 page 270 Keystone Coach Algebra 1</i>								
4-6 weeks (Apr-May)	<i>Apply number theory concepts to show relationships between real numbers in problem-solving settings</i>	Find the Greatest Common Factor and the Least Common Multiple for sets of monomials		Greatest Common Factor, Least Common Multiple	Factor Trees, Upside down division	CC.2.2.HS.D.1	2.1.A1.E	SR3, SR6, 8.4	
		Add, subtract and/or multiply polynomial expressions (binomial times trinomial)		Monomial, Binomial, Trinomial, Polynomial, FOIL method, Coefficient, Distributive Property,	FOIL, Like Terms,	CC.2.2.HS.D.2, CC.2.2.HS.D.3	2.8.A1.B	8.1, 8.2, 8.3,8.4	
	<i>Simplify expressions involving polynomials</i>	Factor algebraic expressions, including difference of squares and trinomials ( $ax^2 + bx + c$ )	Factor trinomials where a is not equal to 1 after the GCF is factored out		Difference of Squares, Trinomials	$a^2 - b^2 = (a + b)(a - b)$ , Factoring Patters(unfoiling/reverse-foiling)	CC.2.2.HS.D.2, CC.2.2.HS.D.4	2.1.A1.B	8.5, 8.6, 8.7, 8.8
		Simplify/reduce a rational algebraic expression			Rational Algebraic Expression	Division of rational numbers become multiplication of reciprocal	CC.2.2.HS.D.2, CC.2.2.HS.D.3	2.8.A1.B	Chapter 8

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