

Grade 8 Intro to Algebra
Crawford Central School District

Concept	Competency	Vocabulary	Strategy	PA Core Eligible Content	PA Core Standards	Scope and Sequence
Essential Question	How do we classify numbers in the real number system?					
Open-Ended Tasks	Performance Coach page 23 - 24; A Million Dollars Task (MDC) http://map.mathshell.org/tasks.php?unit=MA03&collection=9					
Number System	identify numbers as either rational or irrational	Real numbers; rational numbers; irrational numbers; relatively prime		M08.A-N.1.1.1	8.NS.1	4 - 5 weeks
	convert, compare and order real numbers	Real numbers; rational numbers; irrational numbers; relatively prime		M08.A-N.1.1.2; M08.A-N.1.1.4; M08.A-N.1.1.5	8.NS.1	
	estimate values of irrational numbers	Real numbers; rational numbers; irrational numbers; relatively prime		M08.A-N.1.1.3	8.NS.2	
	complete rational number operations	least common denominator; reciprocal; multiplicative inverses		M07.A-N.1.1.1	8.NS.2	
Essential Question	How do mathematical properties allow us to work with expression and equations in algebra?					
Open-Ended Tasks	Buying Chips and Candy Task (MDC) http://map.mathshell.org/tasks.php?unit=MA09&collection=9					
Solving Equations	solve linear equations in one-variable	inverse operation; equation; solution; variable; constant; Distributive Property; like terms; literal equation; term; simplify	Algebra tiles	M08.B-E.3.1.1; M08.B-E.3.1.2	8.EE.7	4 - 5 weeks
	state special types of solutions to linear equations		MDC Lesson Solving Linear Equations in One Variable or	M08.B-E.3.1.1; M08.B-E.3.1.2	8.EE.7	
	solve systems of linear equations algebraically	system of equations; solution to a system; elimination method; substitution	show more than one way to solving systems at the same time	M08.B-E.3.1.4	8.EE.7	
Essential Question	How and when can the Pythagorean Theorem help us to calculate the length of a segment without directly measuring it?					
Open-Ended Tasks	Jane's TV MDC Task					

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Integer Exponents and Pythagorean Theorem	evaluate expressions with integer exponents	negative exponent, power of zero		M08.B-E.1.1.1	8.EE.1	4 - 5 weeks
	simplify expressions using laws of exponents	product of powers with the same base, quotient of powers with the same base, power of a power		M08.B-E.1.1.1	8.EE.1	
	evaluate square and cube roots	rational number; irrational number; perfect square; perfect cube		M08.B-E.1.1.2	8.EE.2	
	write and compare numbers in scientific notation	scientific notation; standard notation		M08.B-E.1.1.3; M08.B-E.1.1.4	8.EE.3	
	perform operations with numbers in scientific notation			M08.B-E.1.1.3; M08.B-E.1.1.4	8.EE.4	
	explain a proof of the Pythagorean Theorem and its converse	Pythagorean Theorem, hypotenuse, legs, right triangle, converse		M08.C-G.2.1.1	8.G.6	
	use the Pythagorean Theorem to determine unknown lengths in right triangles			M08.C-G.2.1.2	8.G.7	
	apply the Pythagorean Theorem to real-world problems		television screens MDC Task	M08.C-G.2.1.2	8.G.7	
	use the Pythagorean Theorem to find the distance between two points in a coordinate system	distance formula		M08.C-G.2.1.3	8.G.8	
Essential Question	How do we recognize when it is appropriate to use a linear model to represent a real world situation, and what are the benefits of using a linear model to answer questions about the situation?					
Open-Ended Tasks	Performance Coach page 174 - 175					
Functions	define a function	relation; function; domain; range; independent variable; dependent variable; vertical line test; ordered pair; coordinate plane; x-axis; y-axis; coordinate		M08.B-F.1.1.1	8.F.1	3 - 4 weeks
	graph a function	function, linear equation		M08.B-F.1.1.1	8.F.1	

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	compare function in various forms (tables, graphically, algebraically, verbal descriptions)	table of values, graph		M08.B-F.1.1.2	8.F.2	
	identify if functions are linear	linear, non-linear		M08.B-F.1.1.3	8.F.3	
	write a function from a table, graph or situation	slope-intercept form		M08.B-F.1.1.2; M08.B-F.2.1.1	8.F.4	
	describe a functional relationship from a graph or verbal description			M08.B-F.1.1.2; M08.B-F.2.1.2	8.F.5	
Essential Question	How do we recognize when it is appropriate to use a linear model to represent a real world situation, and what are the benefits of using a linear model to answer questions about the situation?					
Open-Ended Tasks	Performance Coach page 122 - 123					
Graphing Equations	calculate the slope of a line on a coordinate plane	slope, rate of change, rise, run, linear equation		M08.B-E.2.1.1	8.EE.8	3 - 4 weeks
	graph proportional relationships and compare slopes			M08.B-E.2.1.1;M08.B-	8.EE.8	
	create an equation using slope-intercept form from a graph	slope-intercept form; y-intercept; point-slope form		M08.B-E.2.1.3	8.EE.8	
	solve systems of linear equations graphically	system of equations; solution to a system		M08.B-E.3.1.3	8.EE.8	
	solve systems of linear equations for real-world applications		Fencing MDC Task	M08.B-E.3.1.5	8.EE.8	
Essential Question	How can we use tables and graphs to organize and make conclusions with data?					
Open-Ended Tasks	Performance Coach 306 - 307					
Data Analysis	create scatter plots	scatter plot, x-axis, y-axis		M08.D-S.1.1.1	8.SP.1	3 - 4 weeks
	determine relationships between two sets of data	types of correlation		M08.D-S.1.1.2	8.SP.1	
	draw a line of best fit on a scatter plot	line of best fit; slope-intercept form		M08.D-S.1.1.2	8.SP.2	

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	write an equation for the line of best fit of a scatter plot	slope-intercept form; y-intercept; point-slope form		M08.D-S.1.1.2	8.SP.3	
	use linear models to solve problems and make predictions for data	linear model		M08.D-S.1.1.3	8.SP.3	
	apply the concept of correlation to real-world applications		collect two types of data from the same set of people and see if they are correlated	M08.D-S.1.1.3	8.SP.4	
	graph data in various forms	stem-and-leaf; histogram; box-and-whisker plot; circle graph; line graph, bar graph; frequency table; quartiles, median		M08.D-S.1.2.1		
	calculate measures of central tendency	mean, median, mode, range, outlier		M08.D-S.1.2.1		
Essential Question	How do transformations affect the congruence and similarity of images?					
Open-Ended Tasks	Performance Coach page 265 - 266					
Geometry	understand the congruence of images to the original after rotations, reflections and translations	congruence; rotation, reflection, translation; image		M08.C-G.1.1.2	8.G.1, 8.G.2	5 - 6 weeks
	given two congruent figures, describe a sequence of transformations verifying the congruence			M08.C-G.1.1.2	8.G.1, 8.G.2	
	describe the effect of transformations on two-dimensional figures in the coordinate plane		Representing and Combining Transformations MDC Lesson	M08.C-G.1.1.3	8.G.3	
	understand and describe similarity using transformations	dilation; similarity; corresponding angles; corresponding sides		M08.C-G.1.1.1; M08.C-G.1.1.4	8.G.4	

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	use the formulas for volume of space figures to solve mathematical problems	volume, cone, cylinder, sphere, rectangular prism, cube, pi, radius, diameter		M08.C-G.3.1.1	8.G.9	