## **Introduction to Algebra**

I=Introduce

roduction to Algebra I=Introduce D=Develop I/D=Intro/Dev M=Mastery m=maint	ain	DATE COMPLETED
Translate verbal expressions into mathematics expressions.	M	
Write an expression containing identical factors as an expression using exponents.	M	
Understand and apply the rules for order of operations to evaluate expressions.	M	
Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.*	M	
Solve open sentences by performing arithmetic operations.	M	
Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*	М	
Solve multi-step mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals). Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.*	М	
Recognize and use the distributive property, commutative, and associative properties to simplify expressions.	M	
Translate verbal expressions into equations and formulas.	M	
Explore problem situations by asking and answering questions.	M	
Represent mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.*	D	
Graph integers on a number line.	M	
Add and subtract integers with and/or without using a number line.	M	
Multiply and divide integers.	M	
Find the absolute value of a number.	M	
Compare, order, and understand absolute value of rational numbers.	M	
Write inequalities for graphs on number lines.	M	
Graph inequalities.	D	
Identify rational and irrational numbers.	M	
Find a number between two rational numbers.	D	
Add, subtract, multiply and divide rational numbers.	D	
Solve multi-step mathematical problems that contain rational numbers.	D	
Simplify expressions that contain rational numbers.	D	
Define variables and write equations and inequalities for problems that contain rational numbers	D	
Write verbal problems from equations.	D	

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Algebra

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Equations		
Solve linear equations by using addition, subtraction, multiplication and division.	M	
Solve problems working backwards.	D	
Solve equations involving more than one operation.	M	
Solve equations with the variable on both sides.	M	
Solve equations containing grouping symbols, fractions, or decimals, more that one variable.	D	
Applications of Rational Numbers		
Solve proportions.	M	
Solve percent problems and mixture problems.	D	
Solve problems involving simple interest, percent of increase or decrease, discount or sales tax.	M	
Solve problems by making a table or chart.	M	
Solve problems involving uniform motion by using the formula d=rt.	D	
Solve problems involving direct and inverse variations.	D	
nequalities		
Solve inequalities by using addition, subtractions, multiplication, and division.	M	
Solve inequalities involving more than one operation.	M	
Solve problems by making a diagram.	D	
Solve compound inequalities and graph their solution sets.	D	
Solve problems that involve compound inequalities.	D	
Solve open sentences involving absolute value and graph the solutions.	D	
Create equations and inequalities in one variable and use them to solve problems.*	D	
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*	D	
Explain each step in solving a simple equation. Construct a viable argument to justify a solution method.*	D	
Polynomials		_
Solve problems by looking for a pattern.	D	
Multiply monomials.	M	
Simplify expression involving powers of monomials.	I	
Simplify expressions containing negative exponents.	D	
Express numbers in scientific and decimal notation.	D	
Find products and quotients of numbers expressed in scientific notation.	1	
Find the degree of a polynomial.	M	
Interpret parts of an expression, such as terms, factors, and coefficients.*	М	

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Arrange the terms of polynomials so that the powers of a certain variable are in ascending or descending order.	g D	
Add and subtract polynomials.	M	
Simplify expressions involving polynomials.	M	
Identify and use the FOIL method of multiply two binomials.	M	
Multiply any two polynomials by using the distributive property.	M	
Know and apply the patterns for $(a+b)^2$ , $(a-b)^2$ , and $(a+b)(a-b)$ .	M	
Factoring		
Find the prime factorization of an integer.	M	
Find the greatest common factor (GCF) for a set of monomials.	M	
Use the GCF and the distributive property to factor polynomials.	M	
Use grouping techniques for factor polynomials with four or more terms.	ı	
Solve problems by using guess and check.	ı	
Factor quadratic trinomials.	1	
Identify and factor polynomials that are the differences of squares.	1	
Identify and factor perfect square trinomials.	ı	
Factor polynomials by applying the various methods of factoring.	1	
Use the zero product property to solve equations.	ı	
Rational Numbers and Expressions		
Simplify, multiply, divide rational expressions.	M	
Divide polynomials by binomials.	ı	
Add and subtract rational expressions with like and unlike denominators.	M	
Solve problems by making an organized list of the possibilities.	ı	
Simplify mixed expressions and complex fractions.	M	
Solve rational and radical equations in one variable.*	ı	
Solve problems involving work and uniform motion.	1	
Solve formulas for a specified variable and those that involve rational expressions.	ı	
Functions and Graphs		
Graph ordered pairs on a coordinate plane.	M	
Identify the domain, range, and inverse of a relation.	ı	
Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression		
for the inverse.		
Show relations as sets of ordered pairs and mappings.	D	
Solve linear equations for a specific variable, a given domain.	D	

Graph linear equations and inequalities on a coordinate plane.  Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.*  Know and understand the definition of a function and determine whether a given relation is a function.  Calculate functional values for a given function.  Write an equation to represent a relation, given a chart of values.  Solve problems by using bar and line graphs.  For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features.*  Understand the correspondence between algebra and coordinate geometry (i.e. graph).  Graphing Linear Equations  Find the slope of a line, given the coordinates of two points on the line.  Write a linear equation in standard form given the coordinates of a point on the line and the slope of the line; given the coordinates of two points on the line.  Write an equation in slope-intercept form given the slope and y-intercept.  Determine the x and y intercept of a graph.  Graph linear equations using the x and y intercept of the slope and the y-intercept.  M Graph linear equation in slope intercept form given the slope of a line and the coordinates of a point of the line, given the coordinates of two points on the line.  Write a linear equation in slope intercept form given the slope of a line and the coordinates of a point of the line, given the coordinates of two point on the line.  Write an equation of a line that passes through a given point and is parallel or perpendicular to the	
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graph of a given equation.	
Find the coordinates of a midpoint of a line segment in the coordinate plane given the coordinates of	
the end points.	
Solve problems by using pictograph, circle graphs, and comparative graphs.	
System of Open Sentences	
Solve problems after checking for hidden assumptions.	
Solve simple rational and radical equations in one variable.*	
Solve system of equations by graphing, the substitution method, elimination method using addition and	
subtraction, elimination method using multiplication and addition.	
Solve system of equations of inequalities by graphing.	
Determine whether a system of equations has one solution, no solution, or infinitely many solutions by	
graphing.	
Radical Numbers and Expressions	
Solve problems by using a table.	

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							DATE CONTRETED
	Simplify rational square roots and cube roots.					<u> </u>	
	Find the approximate values for square roots.					D	
	Use the Pythagorean Theorem.					D	
	Identify irrational numbers.					D	
	Rewrite expressions involving radicals and rational e	D					
	Simplify rational expressions involving addition and subtraction.						
	Solve radical equations.	M					
	Find the distance between two points in the coordin	nate plane.				ı	
Qua	adratics						
	Find the equation of the axis of symmetry and the co	oordinates	of the vertex of t	he graph of the	е		
	quadratic function.					<u> </u>	
	Complete the square in a quadratic expression to re	veal the ma	aximum or minim	num value of th	e function		
	it defines.						
	Graph quadratic functions.						
	Find the roots of a quadratic equation by graphing.						
	Solve problems by identifying subgoals.						
	Solve quadratic equations by completing the square, using the quadratic formula.						
	Evaluate the discriminant of a quadratic equation to determine the nature other roots of the equation.						
	Solve problems that can be represented by quadratic equations.					1	
	Find the sum and product of the roots of a quadratic equation.					<u> </u>	
	Write a quadratic equation given its roots.					1	
STA	ATISTICS AND PROBABILITY						
	Interpret numerical data from a table.					M	
	Represent and interpret statistical data on a line plo	t, on a ster	m-and-leaf plot.			M	
	Calculate and interpret the mean, median, mode, ra	nge, quarti	iles, and interqua	rtile range of a	set of	D.4	
	data.					M	
	Represent and interpret statistical data on a box-and	d-whisker p	olot.			M	
	Graph and interpret pairs of numbers on a scatter p	lot.				M	
	Find the probability and/or odds of a simple event.					M	
	Conduct and interpret probability experiments.					D	
	Solve problems by first solving a simpler but related	problem.				D	
	Find the probability of a compound event.B14					D	