

Expressions and Equations: Grade 7

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> - Students will demonstrate the ability to simplify numeric and algebraic expressions by applying the properties of operations and the arithmetic of real numbers. - Students will demonstrate the ability to solve equations and inequalities by applying the properties of equality, inequality, and rational expressions. - Students will demonstrate the ability to model real world problems by building and analyzing the appropriate expression, equation, or function. - Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials. - Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences. - Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style. <u>Content Standards:</u> 7.EE.A.1 - Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. 7.EE.A.2 - Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that "increase by 5% is the same as multiply by 1.05." 7.EE.B.3 - Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. 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. 7.EE.B.4 - Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. - Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. - Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational	Transfer	
	Students will be able to independently use their learning to model with mathematics in order to find an unknown value.	
	Meaning	
	ENDURING UNDERSTANDINGS Students will understand that... rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	ESSENTIAL QUESTIONS - How do you make informed decisions when unknowns are involved? - How is balance maintained?
	Acquisition	
	Students will know... - that properties of operations can be used to manipulate expressions. - that positive and negative rational numbers can be used in any form (decimal, fraction, percent) to solve a problem. - the difference between simplifying and solving. - that expressions can be used to model a given problem. - when multiplying or dividing by a negative number, the inequality sign must be reversed. <u>vocabulary:</u> equivalent expressions, algebraic expression, term, like term, coefficient, constant, evaluate, Identity Properties, substitute, simplify, translate, linear, factor, consecutive, combining like terms, inverse operation, inequality	Students will be skilled at... - using the commutative, associative, distributive, identity, and additive inverse properties to add, subtract, factor, expand, and simplify linear expressions with rational coefficients. - translating words or real-life situations into algebraic equations and inequalities with rational numbers. - solving multi-step mathematical and real world problems with rational numbers using tools strategically. - using mental computation/estimation strategies to assess the reasonableness of an answer. - solving real world problems using linear equations in the forms $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers and x is the variable. - solving real world problems using both algebraic and arithmetic approaches and comparing the steps involved in the two methods. - solving real world problems using linear inequalities in the forms $px + q > r$ and $px + q < r$, where p, q, and r are specific rational numbers and x is the variable. - graphing the solution set of inequalities and interpreting the solution in the context of the problem.

numbers. Graph the solution set of the inequality and interpret it in the context of the problem. • MP1 Make sense of problems and persevere in solving them. • MP2 Reason abstractly and quantitatively. • MP4 Model with mathematics. • MP6 Attend to precision. • MP7 Look for and make use of structure. • MP8 Look for and express regularity in repeated reasoning.		
Content Area Literacy Standards		21st Century Skills
• RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. • RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 6-8 texts and topics</i>. • RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.		• <i>reason effectively</i> • <i>use systems thinking</i> • <i>make judgments and decisions</i> • <i>solve problems</i> • <i>access and evaluate information</i>

Stage 2 - Evidence	
Evaluative Criteria	Assessment Evidence
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan	
Summary of Key Learning Events and Instruction	
Language Arts Integration	Mathematics Integration
1.OA.1 Use	1.OA.1 Use

<i>Technology Integration</i>	<i>District Materials</i>
• 1.OA.1 Use	