

Expressions and Equations: Grade 6

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> - Students will demonstrate the ability to reason with quantities by recognizing and applying proportional relationships. - 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 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> 6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents. 6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. - Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as $5 - y$ - Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms. - Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). 6.EE.A.3 Apply the properties of operations to generate equivalent expressions. 6.EE.A.4 Identify when two expressions are equivalent (i.e., when	Transfer	
	<i>Students will be able to independently use their learning to solve problems involving finding the value of an unknown and be able to support the validity of their solutions.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> rules of arithmetic and algebra can be used together with the importance of equivalence to transform equations and inequalities so solutions can be found.	ESSENTIAL QUESTIONS What is equivalence?
	Acquisition	
	<i>Students will know...</i> - that mathematical equations may be used to determine the value of an unknown number after exploring the use of manipulatives and visual models of equations. - that an expression or equation may be translated into words and words may be translated into an expression or equation. - that the properties of operations can be used to explain equivalence between expressions. - the difference between an equivalent expression and an equivalent equation. - that the negative sign can represent: subtraction, negative, or opposite. - the relationship between independent and dependent variables. - that a variable may represent a single number or a set of numbers. - that the solution set for an inequality includes an infinite number of solutions. <u>vocabulary:</u> coefficient, expression, term, evaluate, variable, inequality, exponent, condition, rational, set, integers, substitution, independent variable, dependent variable	<i>Students will be skilled at...</i> - writing and evaluating numerical expressions with whole number exponents. - writing and solving equations. - using expressions to model problems. - demonstrating equivalence between expressions or equations. - identifying dependent and independent variables. - graphing ordered pairs in all four quadrants of a coordinate plane. - completing function tables. - solving real world problems by graphing points in all four quadrants. - substituting for a variable to evaluate expression. - writing equations with non-negative rational numbers. - writing and solving equations and inequalities representing real life situations. - graphing the solution set for an inequality on a number line. - using substitution to determine if a value is part of the solution set.

the two expressions name the same number regardless of which value is substituted into them). 6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. 6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. 6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all non-negative rational numbers. 6.EE.B.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. 6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. - 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>.		<i>reason effectively</i> <i>solve problems</i> <i>use systems thinking</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

- 1.OA.1 Use

Mathematics Integration

- 1.OA.1 Use

Technology Integration

- 1.OA.1 Use

District Materials