SAU 50
Grade 6
Mathematics
Expressions and Equations

Expressions: the relationship between dependent and independent variables.

Equations: solving one-variable equations and inequalities.

SAU 50 District Competency:

Students will independently use their learning to make use of structure (mathematical concepts, ideas, and patterns) to describe and compare relationships.

Essential Questions

- How is algebra like solving a mystery?
- Which is more important, equality or inequality?
- How do expressions, equations and inequalities model real-world situations?

Acquisition

Students will demonstrate the following to meet the standards.

- I can write and evaluate numerical and algebraic expressions with whole number exponents.
- I can simplify algebraic expressions by combining like terms.
- I can write and solve one-step equations and inequalities using all four operations based on nonnegative mathematical problems and represent on a number line diagram.
- I can identify independent and dependent variables and represent their relationship in a table or graph, e.g. constant speed formula.
- I can generate equivalent expressions by using properties of operations.
- I can 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 nonnegative rational numbers.
- I can write linear equations based on real world situations.
- I can make a table of values based on a linear equation and graph the results on a coordinate plane.

Standards

NH College and Career Ready Standards

Key to Standard Notation:

6.EE.1: 6 *(grade level)* **EE** *(domain: Expressions and Equations)* **1** *(number of the standard)*

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.
6.EE.1: Write and evaluate numerical expressions involving whole-number exponents.
6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.
6.EE.2.a: Write expressions that record operations with numbers and with letters standing for numbers.
6.EE.2.b: 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.
6.EE.2.c: 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.3: Apply the properties of operations to generate equivalent expressions.
6.EE.4: Identify when two expressions are equivalent (when the two expressions name the same number regardless of which value is substituted in them).

Reason about and solve one-variable equations and inequalities.
6.EE.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.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.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 nonnegative rational numbers.
6.EE.8: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in 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.

Represent and analyze quantitative relationships between dependent and independent variables.
6.EE.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 as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

References:

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common Core Standards for Mathematics* (United States, National Governors Association Center for Best Practices, Council of Chief State School Officers). Retrieved August 10, 2016, from http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

Math is fun/definitions. (n.d.). Retrieved April 17, 2017, from http:/www.mathisfun.com/definitions