

Unit 4: Expression, Equations, Inequalities

Content Area: **Mathematics**
Course(s): **Math 3, Math 4, Math 5, Math 6**
Time Period: **February**
Length: **9 weeks**
Status: **Published**

Unit Summary

The goal for this unit is to develop students' understanding of expressions, equations, and inequalities and their applications to real life problem solving. Students will use their prior understanding to develop algebraic understanding, specifically the use of variables in mathematical expressions and equations. In addition, students will be able to represent percents as proportions.

Standards

MA.6.EE	Expressions and Equations
MA.6.EE.A	Apply and extend previous understandings of arithmetic to algebraic expressions.
MA.6.EE.A.1	Write and evaluate numerical expressions involving whole-number exponents.
MA.6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers.
MA.6.EE.A.3	Apply the properties of operations to generate equivalent expressions.
MA.6.EE.A.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
MA.6.EE.A.2a	Write expressions that record operations with numbers and with letters standing for numbers.
MA.6.EE.A.2b	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.
MA.6.EE.A.2c	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).
MA.6.EE.B	Reason about and solve one-variable equations and inequalities.
MA.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.
MA.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.
MA.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 nonnegative rational numbers.
MA.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.
MA.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.
PFL.9.1.8.A.1	Explain the meaning and purposes of taxes and tax deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay.
PFL.9.1.8.C.1	Compare and contrast credit cards and debit cards and the advantages and disadvantages of using each.
PFL.9.1.8.C.4	Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages) and compare the interest rates associated with each.
PFL.9.1.8.C.5	Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, mortgages).
TECH.8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
TECH.8.1.8.A.2	Create a document (e.g., newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.
TECH.8.1.8.A.4	Graph and calculate data within a spreadsheet and present a summary of the results.
TECH.8.1.8.A.CS1	Understand and use technology systems.
TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.8.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.8.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.8.D.CS2	Demonstrate personal responsibility for lifelong learning.
TECH.8.1.8.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.8.F.CS2	Plan and manage activities to develop a solution or complete a project.

Student Learning Objectives

- Students will learn to identify the components of algebraic expressions, equations, and inequalities.
- Students will learn to use proper mathematical vocabulary.
- Students will learn to evaluate algebraic expressions.
- Students will learn to establish equivalent expressions.
- Students will learn to translate word/real life problems into algebraic expressions, equations, and inequalities.
- Students will learn to identify and use mathematical properties.
- Students will learn to identify and combine like terms to rewrite algebraic expressions.
- Students will learn to solve systemically algebraic equations and inequalities using mathematical properties and order of operations.
- Students will learn to graph solution set for inequality statements.
- Students will learn to solve percent proportions.
- Students will learn to analyze functions and determine the relationships.

Essential Questions

- How can algebraic expressions, equations, and inequalities be used to model and analyze our world?

Enduring Understandings

- The students will understand that algebra allows us to make sense of quantitative relationships and patterns.
- The students will understand that algebraic expressions and equations are used to model real life situations and to help solve problems.

Application

- Students will be able to independently use their learning to solve and evaluate algebraic equations and expressions.
- Students will be able to independently use their learning to recognize, graph, and write an equation for constant rate functions.

Skills

Students will be skilled at:

- Translating real life problems to algebraic expressions or equations or inequalities.
- Simplifying and solving expressions and equations and inequalities using order of operations.
- Evaluating and using expressions, equations, and formulas to solve problems.
- Identifying like terms.
- Combining like terms to simplify algebraic expressions and equations.
- Identifying and using mathematical properties to solve algebraic expressions and equations.
- Calculating a percent of a quantity as a rate per 100.
- Solving problems involving finding the whole, given portion, and the percent.
- Representing relationships between dependent and independent variables.