Unit 2- Pre-Algebra Review

Content Area: **Mathematics**
Course(s): **Algebra, Math 8**
Time Period: **September**
Length: **16 Days**
Status: **Published**

Unit Summary

The school year starts with this unit. This unit addresses a variety of pre-requisite skills and concepts including operations with signed numbers, order of operations, combining like terms, applying the distributive property, and operations with fractions. These topics are reviewed, as needed, based on the results of a pre-test near the beginning of school. They are also extended into related 8th grade and Algebra 1 topics that include classifying and comparing real numbers, classifying polynomials, evaluating powers, interpreting absolute value, adding/subtracting/multiplying polynomials, and dividing polynomials by monomials.

Standards

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.8.NS.A	Know that there are numbers that are not rational, and approximate them by rational numbers.
MA.A-SSE.A	Interpret the structure of expressions
MA.8.NS.A.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
MA.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.
MA.8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
MA.A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.
MA.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.N-VM.C	Perform operations on matrices and use matrices in applications.
MA.N-VM.C.6	Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.
MA.N-VM.C.7	Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
MA.N-VM.C.8	Add, subtract, and multiply matrices of appropriate dimensions.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed

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.D.CS2	Demonstrate personal responsibility for lifelong learning.

Student Learning Objectives

- Students will learn to classify real numbers.
- Students will learn to evaluate variable expressions.
- Students will learn to evaluate a power.
- Students will learn to use order of operations.
- Students will learn to find the opposite and absolute value of a number.
- Students will learn to graph, compare, and order real numbers.
- Students will learn to evaluate expressions with signed numbers for all four operations.
- Students will learn to use the distributive property.
- Students will learn to simplify an expression by combining like terms.
- Students will learn to classify polynomials by number of terms and degree.
- Students will learn to multiply and divide monomials involving exponents.
- Students will learn to multiply and divide a polynomial by a monomial.
- Students will learn to add and subtract polynomials.
- Students will learn to compare and order signed proper fractions, signed improper fractions, and signed mixed numbers.
- Students will learn to write equivalent fractions.
- Students will learn to perform all operations with signed fractions.
- Students will learn to solve word problems involving fractions.
- Students will learn to content addition of multiplying binomials and polynomials.
- Students will learn to content addition for operations with matrices.

Essential Questions

- How do recognizing, understanding, and applying standard rules of math ensure consistent results?
- How do complex, real-life scenarios require the language of math?
- What does the language of math look like?

Enduring Understandings

- Students will understand that standard mathematical procedures assure consistent results.
- Students will understand that mathematical models of complex, real-life scenarios require polynomials.
- Students will understand that mathematics is a language of carefully designed terms and symbols.
- Students will understand that mathematics is used to make informed decisions about problems in every day life.

Application

- Students will be able to independently use their learning to apply rules for evaluating powers including signed bases.
- Students will be able to independently use their learning to apply rules for evaluating expressions involving all four operations using signed numbers.
- Students will be able to independently use their learning to identify the unique characteristics of linear and quadratic expressions.
- Students will be able to independently use their learning to simplify expressions.
- Students will be able to independently use their learning to identify rules for signed fractions and apply them in to problem solving.

Skills

Students will be skilled at:

- Utilizing the number line as a physical representation of the relationships between all real numbers.
- Applying their understanding of opposite numbers and the absolute value of a number or expression.
- Simplifying expressions.
- Explaining how fractions are rational numbers that represent parts of a whole.
- Explaining how fractions also represent ratios and division.
- Utilizing signed fractions to solve.