HPISD Fifth Grade TAG Math

UNIT NAME	ESTIMATED DURATION	9 WEEKS			
UNIT 4: EXPRESSIONS, EQUATIONS, AND RELATIONSHIPS	**18 DAYS**	1	**2**	**3**	4

Unit Overview

The student applies mathematical process standards to use multiple representations to describe algebraic relationships.
The student applies mathematical process standards to develop concepts of expressions and equations.
The student applies mathematical process standards to use equations and inequalities to represent situations and solve problems.

Enduring Understandings

The student will understand that:	• Tables and graphs that contain relationships, which can be expressed through multiple representations. • Mathematical relationships can be generalized, expressed, and made equivalent in numerical, verbal, and algebraic form. • Expressions can be generated and evaluated using equivalence. • A variable is used to represent an unknown value. • Integers and coordinate pairs are the mathematical representation of real-world situations. • Numerical expressions can be generated using order of operations, including whole number exponents and prime factorization

Concepts

Equivalent Expressions	Expressions that have the same value
Algebraic Expression	Expression that contains one or more variables and may also contain operation symbols, such as + or - .
Variable	Letter or symbol used to represent an unknown or unspecified number and value of a variable may change
Constant	Specific number whose value does not change
Evaluating	Substitute a number for a variable and then find the value of an expression
Equation	Mathematical statement that two expressions are equal
Solution	A value of the variable that makes the equation true
Inverse Operations	Operations that undo each other
Addition Property of Opposites	Property that states that the sum of a number and its opposite equals zero
Associate Property of Addition/Multiplication	For three or more numbers, their sum is always the same, regardless of their grouping
Commutative Property of Addition/Multiplication	Two or more numbers can be added/multiplied in any order without changing the sum/product
Distributive Property	If you multiply a sum by a number, you will get the same result if you multiply each addend by that number and then add the products
Identity Property (for Addition)	Property that states that the product of 1 and any number is that number

Identity Property (for Multiplication)	Property that states that the sum of zero and any number is that number
Multiplication Property for Zero	Property that states that the product of any number and 0 is 0
Coordinate Plane	A plane formed by the intersection of horizontal number line called the x-axis and a vertical number line called the y-axis
Linear Relationship	As one quantity changes by a constant amount, the other quantity also changes by a constant amount
Exponents	The number that indicates how many times the base is used as a factor
Prime Factorization	A number written as the product of its prime factors
Order of Operations	A rule for evaluating expressions

Guiding/Essential Questions

- How can you use order of operations to evaluate algebraic expressions?
- How can you use order of operations to simplify expressions with exponents?
- How do you use exponents to represent numbers?
- How do you write the prime factorization of a number?
- How do you identify and write equivalent expressions?
- How can you use linear relationships to solve real-world problems?
- How do you use tables and verbal descriptions to describe a linear relationship?
- How do you locate and name point in the coordinate plane?

Learning Targets & Progressions

- **Student will describe their understanding of relationships between variables using visual representations and equations.**
  - Understand that a variable represents an unknown number
- **Students will apply properties of operations to generate equivalent expressions including whole number exponents and prime factorization.**
  - Identify prime and composite numbers
  - Understand properties of multiplication and addition
- **Students will extend their understanding of number lines and integers to describe and display the relationship between two ordered pairs.**
  - Ordered pairs, understand x-axis and y-axis
  - Apply integer operation rules
- **Students will evaluate expressions containing order of operations and exponents.**
  - Solve multistep problems involving all four operations
  - Apply integer operation rules
  - Simplify expressions with two levels of grouping

Formative Assessments	Summative Assessments

TEKS: Readiness Standards	TEKS: Supporting Standards
5.4B represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity **5.4C** generate a numerical pattern when given a rule in the form y = ax or y = x + a and graph	**5.4A** identify prime and composite numbers **5.4D** represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models **5.4E** describe the meaning of parentheses and brackets in a numeric expressions

5.4F simplify numerical expressions that do not involve exponents, including up to two levels of grouping **5.8C** graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table **6.6C** represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ **6.7A** generate equivalent numerical expressions using order of operations, including whole number exponents, and prime factorization **6.7D** generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative and distributive properties **6.10A** model and solve one-variable, one-step equations and inequalities that represent problems including geometric concepts **6.11A** graph points in all four quadrants using ordered pairs of rational numbers	**5.8A** describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0,0); the x-coordinate, the first number in an ordered pair, indicates movement parallel to the x-axis starting at the origin, and the y-coordinate, the second number, indicates movement parallel to the y-axis starting at the origin **5.8B** describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane **6.6A** identify independent and dependent quantities from tables and graphs **6.7B** distinguish between expressions and equations verbally, numerically, and algebraically **6.7C** determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations **6.9A** write one-variable, one-step equations and inequalities to represent constraints or conditions within problems **6.9B** represent solutions for one-variable, one-step equations and inequalities on number lines **6.9C** write corresponding real-world problems given one-variable, one-step equations or inequalities **6.10B** determine if the given values make one-variable, one-step equations or inequalities true

TEKS Process Standards

5.1A/6.1A apply mathematics to problems arising in everyday life, society, and the workplace
5.1B/6.1B use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution
5.1C/6.1C select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems
5.1D/6.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
5.1E/6.1E create and use representations to organize, record and communicate mathematical ideas
5.1F/6.1F analyze mathematical relationships to connect and communicate mathematical ideas
5.1G/6.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Processes and Skills: **What students should be able to DO**	**Facts:** **What students should KNOW**
• Represent a situation using graphic representations and equations • Generate equivalent expressions using properties of operations • Graph ordered pairs of rational numbers in all four quadrants • Solve expressions using order of operations and exponents	• Distinction between independent and dependent variables • Properties of operations • Distinction between expressions and equations • Key attributes of the coordinate plane

Topics	
Algebraic Expressions Associate Property of Addition/Multiplication Commutative Property of Addition/Multiplication Coordinate Grid Distributive Property Equivalent Expressions Exponents Identity Property (Addition/Multiplication)	Independent and Dependent Variables Linear Relationships Multiplication Property of Zero Order of Operations Prime Factorization Properties of Operations Solutions Variables
Language of Instruction	
algebraic properties comparing expressions coordinate grid dependent equation equivalent expression evaluating exponents expression generate expression integers	inverse operation linear relationship Order of Operations ordered pair Prime Factorization quantities solution variable x-axis y-axis
State Assessment Connections	**National Assessment Connections**
Resources	
HMH, Texas Go Math! Unit 4 Page 263-416	