| **Grade:** 5<br>**Subject:**<br>Mathematics | **Unit 8: Algebra, Functions and Graphs** |
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| **Big Idea/Rationale** | • In this unit, students solve and graph equations in the coordinate plane. Students work with exponents, prime factorization and the order of operations. They write and evaluate expressions, equations and inequalities. Students also write rules and equations for function tables and plot and locate points in the coordinate plane. Finally, they combine these skills to graph functions in the coordinate plane. |
| **Enduring Understanding (Mastery Objective)** | Students will understand that:<br>• Properties of equality and inverse operations can be used to solve equations.<br>• The value of an equation containing unknowns can be true or false depending on the replacement values of the unknowns.<br>• A number can be factored into prime factors in exactly one way regardless of the order of the factors.<br>• Some quantities have a mathematical relationship so that the value of the one quantity can be found if you know the value of the other quantity.<br>• A graph of a linear equation contains all of the points on the coordinate grid whose x- and y- coordinates satisfy the equation.<br>• Some problems with the initial data point unknown can be solved by starting with the end results and by reversing the steps and processes to find the initial data point. |
| **Essential Questions (Instructional Objective)** | • How are equations solved?<br>• How do you find rules for numerical patterns?<br>• How can you find all the factors of a number?<br>• How do you graph an equation on a coordinate grid?<br>• How do you solve problems by working backward? |
| **Content (Subject Matter)** | • Use exponents to simplify expressions and solve equations.<br>• Find the prime factorization of composite number.<br>• Use the Order of Operations to simplify expressions and solve equations.<br>• Use the Order of Operations to simplify expressions that include exponents.<br>• Write and solve one-step and two-step equations for problem situations.<br>• Use properties of equality to understand equations.<br>• Write situation and solution equations for problem situations.<br>• Evaluate expressions, equations and inequalities.<br>• Use expressions, equations and inequalities to represent real-world situations.<br>• Represent one- and two-operation functions with tables, rules and equations.<br>• Write equations for real-world functions.<br>• Use functions to solve real-world problems.<br>• Read and plot points in Quadrant I of the coordinate plane. |

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| | • Use coordinates to determine segment lengths and perimeters.<br>• Solve problems involving multiple paths and routines.<br>• Graph a function using a table, a verbal rule and an equation.<br>• Solve a variety of problems using mathematical concepts and skills.<br>• Plot points in the coordinate plane.<br>• Write the equation of a line.<br>• Graph linear functions. |
| **Skills/ Benchmarks (CCSS Standards)** | • **5.OA.A.1**: Use parentheses, brackets or braces in numerical expressions, and evaluate expressions with these symbols.<br>• **5.OA.A.3:** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.<br>• **5.G.A.1:** Use a pair of perpendicular number lines, called axes to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).<br>• **5.G.A.2:** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.<br>• **Mathematical Practices** |
| **Materials and Resources** | • Math Expressions, Student Journals, Manipulatives, Math themed literature, BrainPop, IXL Mathematics |