Skills and Strategies

- Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems (B.1.a)
- Use a variety of strategies to set up and solve increasingly complex problems (B.1.b)
- Represent data, real-world situations, and solutions in increasingly complex ideas orally and in writing, using symbols and notations correctly (B.1.c)
- Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly (B.1.d)
- Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems (B.1.e)
- Make mathematical connections among concepts, across disciplines, and in everyday experiences (B.1.f)
- Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established) (B.1.g)
- Apply previously learned mathematical concepts in more advanced contexts (B.1.h)

Pre-Requisites for this Course

- Find the greatest common factor and least common multiple of a set of whole numbers (A.1.b)
- Use rational numbers to demonstrate knowledge of additive and multiplicative inverses (A.1.c)
- Simplify ratios (A.1.d)
- Use scientific notation when working with very large or very small quantities (A.1.e)
- Add, subtract, multiply, and divide rational numbers, including integers, fractions and decimals, without calculators (A.1.f)
- Graph linear inequalities in one variable on the real number line to solve problems (D.2.a)
- Identify the effect on mean, median, mode and range when a set of data is changed (G.1.a)
- Interpret data from line, bar, and circle graphs, histogram, scatterplots, box-and-whisker plots, stem-and-leaf plots, and frequency tables to draw inferences and make predictions (G.1.b)
- Identify the most efficient way to display data (G.1.h)

Unit 1: Algebraic Expressions

- Set up and solve problems following the correct order of operations (including proportions, percent, and absolute value) with rational numbers (integers, fractions, decimals) (A.1.a)
- Evaluate and simplify expressions requiring addition, subtraction, multiplication, and division with and without grouping symbols (C.1.a)
- Translate real-world problems into expressions using variables to represent values (C.1.b)
- Apply algebraic properties (e.g., commutative, associative, distributive, identity, inverse, substitution) to simplify algebraic expressions (C.1.c)

Unit 2: Solving Equations and Inequalities

- Solve single-step and multistep equations and inequalities in one variable (D.1.a)
- Solve equations that contain absolute value (D.1.b)
- Solve formulas for a specified variable (D.1.c)

Unit 3: Relations and Functions

- Give the domain and range of relations and functions (D.2.b)
- Evaluate functions at given values (D.2.c)
- Identify graphs of relations and functions and analyze them to determine whether a relation is a function (e.g., vertical line test) (D.2.d)
- Use terminology associated with the Cartesian plane in describing points and lines (D.2.f)
- Translate between different representations of relations and functions: graphs, equations, sets of ordered pairs, verbal descriptions, and tables (D.2.i)
- Identify graphs of quadratic functions (E.2.a)

Unit 4: Linear Functions

- Write and graph linear equations and inequalities from real world solutions (e.g., a constant-rate distance/ time problem) (D.1.d)
- Write linear equations in standard form and slope-intercept form when given two points, a point and the slope, or the graph of the equation (D.1.e)
- Graph linear inequalities with two variables on the standard (x, y) coordinate plane (D.2.e)
- Recognize the concept of slope as a rate of change and determine the slope when given the equation of a line in standard form or slope-intercept form, the graph of a line, two points, or a verbal description (D.2.g)
- Graph a linear equation using a table of values, x- and y-intercepts, slope-intercept form, and technology (D.2.h)
- Identify arithmetic sequences and patterns in a set of data (G.1.c)
- Identify and approximate line of best fit to model data and make predictions (G.1.g)

Unit 5: Systems of Equations

- Solve systems of two equations using various methods, including elimination, substitution, and graphing with and without technology (D.1.g)

Unit 6: Polynomials

- Add and subtract polynomials (C.1.d)
- Multiply monomials, binomials, trinomials, and polynomials (C.1.f)

Unit 7: Factoring

- Factor a monomial from a polynomial (C.1.e)
- Factor perfect square trinomials and the difference of two squares (E.1.a)
- Factor trinomials in the form $ax^2 + bx + c$ (E.1.b)

Unit 8: Quadratic Equations

- Solve quadratic equations using multiple methods, including graphing, factoring, and the square root principle (E.1.c)
- Relate factors, solutions (roots), zeros of related functions, and x-intercepts in equations that arise from quadratic functions (E.2.b)

Unit 9: Exponents and Exponential Functions

- Use properties of exponents (including zero and negative exponents) to evaluate and simplify expressions (F.1.a)
- Identify patterns of growth (e.g., patterns of exponential growth) in a set of data (G.1.d)

Unit 10: Radical Expressions

- Find rational number square roots (without calculators) and approximate irrational square roots (with and without calculators) (F.1.d)
- Evaluate and simplify radical expressions (F.1.e)
- Multiply radical expressions (F.1.f)
- Simplify an algebraic quotient by rationalizing and irrational monomial denominator (F.1.g)

Unit 11: Rational Expressions

- Identify, formulate, and obtain solutions to problems involving direct and inverse variation (D.1.f)
- Evaluate and simplify rational expressions (F.1.b)
- Add, subtract, multiply, and divide rational expressions (F.1.c)

Probability Unit

- Find the probability of a simple event (G.1.e)
- Distinguish between independent and dependent events (G.1.f)