Mathematics Program Enduring Understandings

Students will understand that:

The Nature of Mathematics

- Mathematics is a language of carefully defined terms and symbols.
- Mathematics is used to make informed decisions about problems in everyday life.

Numbers and Operations

- There are multiple representations for any number.
- Numbers are classified and compared within our number system.
- Depending on the situation, calculations may be done using; mental math or paper-and-pencil calculations using a variety of mathematically sound algorithms.
- Estimates help determine the reasonableness of an answer.
- Expressions are simplified using a predetermined order of operations.

Measurement

- Measurements collected using any tools (except for counting) are estimates with an accepted level of error.
- All measurements consist of exactly three parts: number, unit, and precision.
- Changing one linear dimension in a figure with two or three dimensions will have a different affect on the figure's perimeter, circumference, area, or volume.

Geometry

- Points, lines, and planes are the building blocks of geometry.
- Each geometric figure has a specific naming convention.
- Postulates, theorems, definitions, and properties are used to:
    - justify reasoning in a direct proof
    - establish relationships involving two and three-dimensional figures.
- Logical thinking and critical reasoning skills are important aspects of problem solving.
- A shape's characteristics (dimensionality, side measures, angle measures, faces, edges, area, perimeter and volume) are used for identification.
- The Pythagorean Theorem and trigonometric ratios are used to find missing quantities in right triangles.
- Concepts of congruency and similarity are used to relate and compare 2 and 3- dimensional figures.

Algebraic Concepts

- Algebraic rules and properties determine how expressions are simplified and how equations are solved.
- Problems involving a constant rate of change can be modeled using proportional reasoning.
- Algebraic expressions, equations, inequalities, and functions (linear, absolute value, quadratic, polynomial, exponential, and logarithmic)are used to model relationships between quantities in real-world situations.
- Patterns and functions can be generalized and represented using; verbal models, tables, equations, and graphs.
- Systems of equations are solved both graphically and algebraically and are used to model real-life problems.

Data Analysis and Probability

- Data is collected, organized, and displayed for analysis.
- Interpretations and predictions about data are influenced by the method that data is collected and displayed.
- Probability is used to make informed predictions and inferences.