Cresthill Middle

Journey Learning

Building sturdy human beings…

7th Grade Mathematics

Course Description

The focus of this course is to continue to build the foundation necessary for success in the study of algebra. The instruction will be rigorous and concentrate on developing particular skills as defined by the Colorado Academic Standards. This course prepares students for the CMAS Test, taken in the spring. The quality of work will allow students to gain a deeper understanding of the concepts and become fluent in the application, as well as make connections between the the processes and real-world applications. Students will concentrate on the following domains: Real number system, expressions, equations and inequalities, ratios and proportional relationships, geometry, and statistics and probability.

Essential Questions to be Explored

- How do I interpret the solutions for equations and inequalities in the context of the problem?
- How can proportions increase our understanding of the real world?
- When should we use additive inverse or multiplicative inverse?
- What is the result of (what happens when) adding a number and its inverse or multiplying a number and its inverse?
- How do I assess the reasonableness of my answer?
- How do you find the surface area and volume of a 3D figure?
- How are lists, tables, tree diagrams or simulation used to find the probability of an event?
- How is probability used to predict frequency of an event?
- How can I apply the order of operations and the fundamentals of algebra to solve problems?

Content Standards

Number Sense, Properties, and Operations

• Proportional reasoning involves comparisons and multiplicative relationships among ratios
• Formulate, represent, and use algorithms with rational numbers flexibly, accurately, and efficiently

Patterns, Functions, and Algebraic Structure

• Properties of arithmetic can be used to generate equivalent expressions
• Equations and expressions model quantitative relationships and phenomena

Data Analysis, Statistics, and Probability

• Statistics can be used to gain information about populations by examining samples
• Mathematical models are used to determine probability

Shape, Dimension, and Geometric Relationships

• Modeling geometric figures and relationships leads to informal spatial reasoning and proof
• Linear measure, angle measure, area, and volume are fundamentally different and require different units of measure

Disciplinary Skills

- ✓ Make sense of problems and persevere in solving them
- ✓ Construct viable arguments and critique reasoning of others
- ✓ Model with mathematics
- ✓ Reason abstractly and quantitatively
- ✓ Look for and make use of structure (patterns)

Units of Study

• **Rational and Irrational Numbers** – repeating/terminating decimals, fractions, concept of infinity, placement on number lines, comparisons, sorting, ordering, Venn diagrams, and calculator functionality that aides in understandings

• **Algebraic Concepts** – variables, like terms, simplifying expressions, distributive property, equivalencies, solutions, inverse operations, solving equations and inequalities, and graphing inequalities

• **Proportions** – recognizing proportional situations in our world, learning how to set up a proportional algebraic equation, solving proportion equations with various methods, applying previously learned algebra concepts to solve algebraic proportions

• **Angles and Line Relationships** – Complementary/supplementary angles, parallel/transversal line relationships, interior/exterior angles of triangles

• **3-Dimensional Shapes** – Properties of various prisms and pyramids, cylinders, cones, and spheres, applying volume and surface area formulas/concepts to solve real-world problems, cross-sections

• **Statistics** – expanding understandings of mode, median, mean, and range, box plots, line plots, graphs, analyzing data, conducting surveys, learning bias and fair questioning techniques

• **Probability** – experimental and theoretical, lists, tables, and tree diagrams, random sampling to draw conclusions