Cresthill Middle

Journey Learning

Building sturdy human beings…

Middle School Algebra

Course Description

In Middle School Algebra I, students will build upon Accelerated Math 7 concepts as well as develop skills necessary for success in upper level math and science courses. This course is designed to emphasize the study of multiple representations of linear and nonlinear functions. It includes mathematical concepts for working with rational numbers, various expressions, analyzing and solving linear equations & inequalities, data analysis, statistics, and polynomials. Students will use hands-on materials and calculators when needed in solving problems in which algebra concepts are applied. In addition, the Colorado Academic Standards will be incorporated into daily lessons. Students in Algebra I will take the CMAS Math Assessment in the spring. Students who successfully complete Middle School Algebra I will take Geometry or Honors Geometry the next academic school year.

Content Standards

Number Sense, Properties, and Operations

- The complex number system to include real numbers.
- Quantitative reasoning is used to make sense of quantities and their relationships in problem situations.

Patterns, Functions, and Algebraic Structures

- Functions model situations where one quantity determines another and can be represented algebraically, graphically, and using tables.
- Quantitative relationships in the real world can be modeled and solved using functions.
- Expressions can be represented in multiple, equivalent forms
- Solutions to equations, inequalities and systems of equations are found using a variety of tools.

Data Analysis, Statistics, and Probability

- Visual displays and summary statistics condense the information in data sets into usable knowledge.
- Statistical methods take variability into account supporting informed decisions making through quantitative studies designed to answer specific questions.
- Probability models outcomes for situations in which there is inherent randomness.

Disciplinary Skills

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

Essential Questions to be Explored

- ❖ *Can I identify important quantities in situations and describe their relationships using graph?*
- ❖ *Can I create a representation of a problem and understand the meaning or the quantities using tables, graphs and equations.*
- ❖ *Am I considering all available tools (multiple methods, different representations, graphing calculator) as I approach this problem?*
- ❖ *Am I taking advantage of everything I have learned this year to really engage with the mathematics and understand the problems I am solving?*
- ❖ *Can I explain my understanding of mathematics to others?*
- ❖ *Can I look closely to see a pattern of structure in these functions?*
- ❖ *When patterns are repeated, can I find shortcuts that lead to equations?*

Units of Study

- ***Functions*** – Investigate the growth of patterns
- ***Simplifying and Solving*** – Simplifying exponential expressions, exploring an area model, work with multi-variable equations.
- ***Systems of Equations*** - Solving word problems by writing equations, solving systems using tables, graphs, substitution, and elimination and choosing a strategy for solving systems.
- ***Sequences*** **-** Representing exponential growth, generating and investigating sequences (arithmetic/recursive), patterns of growth in tables and graphs, and comparing sequences to functions.
- ***Statistical Analysis*** **-** Line of best fit**,** correlation coefficient, and linear, quadratic, exponential growth/decay**.**
- ***Quadratic Functions*** **-** Factoring quadratics (special cases and shortcuts) and multiple representations for quadratic functions.
- ***Solving Quadratics and Inequalities*** **-** Choose a strategy (graphing, zero product property, quadratic equation), solve one and two variable inequalities, graphing linear and nonlinear inequalities, systems of inequalities and applying inequalities to solve problems.
- ***Solving Complex Equations*** **–** Look for association in two-way tables**,** solving and application, and intersection of two functions.
- ***Functions and Data*** - Transforming functions, investigating data representation, relation treasure hunt, investigating complex functions.
- ***Radical Expressions and Equations*** - Adding and subtracting radicals, multiplying radicals, simplifying radicals by rationalizing the denominator.