

COURSE DESCRIPTION PRE-ALGEBRA

Philosophy Statement: Mathematics instruction has four main functions. First, it equips students to function effectively in an ever-changing world by becoming proficient in computational and communication skills. Second, it enables students to understand and apply mathematical concepts in everyday life. Third, it develops higher-order thinking skills necessary to make a contribution in related fields of study, research, and technology. Finally, it clearly illustrates the order and structure of the world God created.

Objectives: Students will know the properties of, and compute with, rational numbers expressed in a variety of forms. Students will read, write and compare rational numbers, and understand how to differentiate between rational and irrational numbers. Students will calculate with percentages, factor, work with permutations and combinations, multiply and divide exponential values, and represent quantitative values graphically and formulaically. Students will calculate the surface area of three-dimensional objects, and calculate the area and volume of two- and three-dimensional shapes. Students will distinguish between linear and nonlinear functions. Students will use and manipulate Pythagorean Theorem to deepen their understanding of the attributes of figures. Students will begin to utilize the quadratic equation and understand quadratic systems in plotting linear and nonlinear functions on a coordinate plane.

Textbook: Pre-Algebra (Glencoe Mathematics, California Edition)

Units of Study:

Algebraic Tools: Including Numbers, Expressions, Variables, and Properties

Absolute Value, Operations using Integers (addition, subtraction, multiplication, division), Distributive Property, Combining Like Terms, Solving Multi-Step Equations using Inverse Operations, Solving Equations with variables on both sides of the equation, Laws of Exponents and applying them to equations, squares and square roots, operations with polynomials

Factors and Fractions: LCM, GCF, Prime Factorization, Scientific Notation

Rational Numbers: Converting between fractions, decimals and percent; operations with fractions (like, unlike and mixed numbers); arithmetic and geometric sequences;

Ratio, Proportion and Percent: Ratio, Rates, Using Proportions, Scale factors and drawings, Percent proportion and equations, Percent of change, probability and predictability (included simple and compound probability)

Linear Equations, Inequalities and Functions Applying Algebra to Geometry: 2 variable equations, graphing, slope, rate of change, slope-intercept form, writing linear equations, best fit lines, system of equations, graphing inequalities with one and two variables.

Right Triangles: Angles, Angle Relationships, types of triangles (categorized by sides and angles), pythagorean theorem, distance and midpoint formulas, similar triangles, trigonometry functions (sine, cosine and tangent)

Two-Dimensional Figures: Line and Angle Relationships, Congruent Triangles, Transformations on a coordinate plane, types of quadrilaterals, Area of polygons (3-8 sides), Angle relationships of polygons both inside and outside the polygon (3-13 sides), circumference and area of circles, perimeter and area of irregular figures

Three-Dimensional Figures: Build 3-D shapes, Surface Area and Volume, Similar Solids.

Nonlinear Functions: Graphing quadratic and cubic functions

Project: Design a 2 bedroom, 1 bathroom home. Scale furniture to place in designed home. Determine mortgage and interest rate for designed home.

Areas to be evaluated: Tests, Homework, Classwork, Quizzes