

Phoenix Christian Sr High School

MTH090 Pre Algebra

Course Scope & Sequence

COURSE DESCRIPTION

The goal of the mathematics program is to provide students with a well-rounded base of mathematical knowledge that they will be able to apply in a variety of contexts. We also underscore the hand of God in creation through mathematics. The Pre Algebra objective is to prepare students for Algebra 1 by learning to solve simple equations that involve whole numbers, fractions and decimals.

REQUIRED TEXTS AND *KEY SUPPLEMENTAL MATERIALS

Pre-Algebra Tools for a Changing World, Prentice Hall

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM)

STANDARDS: NCTM Standards are referenced at the end of each quarter.

COURSE SCOPE AND SEQUENCE

First Quarter

Algebra Expressions and Integers 3 Weeks

Key Concepts: Variables and Expressions, The Order of Operations, Evaluating Expressions, Integers and Absolute Value, Adding and Subtracting Integers, Inductive Reasoning, Look for a Pattern as a Problem Solving Strategy, Multiplying and Dividing Integers, The Coordinate Plane.

Assessments: Two Tests, Quizzes, Homework Assignments.

Solving One Step Equations and Inequalities 3 Weeks

Key Concepts: Properties of Numbers, The Distributive Property, Simplifying Variable Expressions, Variables and Expressions, Solving Equations by Adding and Subtracting, Solving Equations by Multiplying and Dividing, Inequalities and Their Graphs, Solving One-Step Inequalities by Adding or Subtracting, Solving One-Step Inequalities by Multiplying or Dividing.

Assessments: Two Tests, Quizzes, Homework Assignments.

Decimals and Equations 3 Weeks

Key Concepts: Rounding and Estimating, Estimating Decimals Products and Quotients, Mean-Median-and Mode, Using Formulas, Solving Equations by Adding or Subtracting Decimals, Solving Equations by Multiplying or Dividing Decimals, Using the Metric System, Simplify a Problem as a Problem Solving Strategy

Assessments: Two Tests, Quizzes, Homework Assignments.

NCTM Standards: Compare and contrast the properties of numbers and number systems, including the rational and real numbers; judge the effects of such operations as multiplication, division, and computing powers and roots on the magnitudes of quantities; make decisions about units and scales that are appropriate for problem situations involving measurement; use unit analysis to check measurement computations.

Biblical Integration: The infinite nature of God will be addressed in this unit on operations with real numbers. Just as our numbering system extends without end so does the universe that God created. Students will discover that some entities, such as God's love, are immeasurable and just can't be quantified within the parameters of mathematics

Second Quarter

Factors, Fractions, and Exponents 4 Weeks

Key Concepts: Divisibility and Factors, Exponents, Prime Factorization and Greatest Common Factor, Simplifying Fractions, Rational Numbers, Exponents and Multiplication, Exponents and Division, Scientific Notation
Assessments: Two Tests, Quizzes, Homework Assignments.

Operations with Fractions 4 Weeks

Key Concepts: Comparing and Ordering Fractions, Fractions and Decimals, Estimating with Fractions and Mixed Numbers, Adding and Subtracting Fractions, Multiplying and Dividing Fractions, Customary Units of Measurement, Greatest Possible Error, Working Backward to Solve a Problem, Solving Equations by Adding or Subtracting Fractions, Solving Equations by Multiplying Fractions, Powers of Products and Quotients.
Assessments: Two Tests, Quizzes, Homework Assignments.

Final Exam Preparation 1 Week

Key Concepts: Unit 1-5 Review
Assessments: Final Exam

NCTM Standards: Develop a deeper understanding of very large and very small numbers and of various representations of them; use number-theory arguments to justify relationships involving whole numbers; develop fluency in operations with real numbers.

Biblical Integration: The constant, unchanging character of God will be addressed in this unit. Students will extrapolate the constant nature of math to the constant nature of God. Students will further recognize that the unchanging nature of the universe is what makes mathematics possible.

Third Quarter

Ratios, Proportions, and Percents 4 Weeks

Key Concepts: Ratios and Unit Rates, Converting Between Measurement Systems, Proportions, Similar Figures and Scale Drawings, Dilations, Probability, Fractions – Decimals - and Percents, Proportions and Percents, Percents and Equations, Percent of Change, Markup and Discount

Assessments: Two Tests, Quizzes, Homework Assignments.

Solving Equations and Inequalities 5 Weeks

Key Concepts: Solving Two-Step Equations, Solving Multi-Step Equations, Multi-Step Equations with Fractions and Decimals, Write an Equation to Help Solve a Problem, Solving Equations with Variables on Both Sides, Solving Two-Step Inequalities, Compound Inequalities, Transforming Formulas, Simple and Compound Interest

Assessments: Two Tests, Quizzes, Homework Assignments.

NCTM Standards: Use symbolic algebra to represent and explain mathematical relationships; Understand and apply basic concepts of probability; understand and represent translations, reflections, rotations, and dilations of objects in the plane.

Biblical Integration: The unit on similarity will provide an opportunity to discuss how we are created in God's image but yet we are not equal to God. Polygons can have certain congruent attributes but yet be distinctively different from each other. When solving equations, students will note that the variable changes in value from one problem to the next. Students will recognize that there is no variableness with God.

Fourth 9 Quarter

Linear Functions and Graphing 2 Weeks

Key Concepts: Relating Graphs to Events, Relations and Functions, Equations with Two Variables, Direct Variation, Slope and y-intercept, Graphing Lines, Writing Rules for Linear Functions, Scatter Plots, Solving Problems by Graphing, Solving Systems of Equations, Graphing Linear Inequalities

Assessments: Two Tests, Quizzes, Homework Assignments.

Spatial Thinking 2 Weeks

Key Concepts: Introduction to Geometry, Points, Lines and Planes, Angle Relationships and Parallel Lines, Classifying Polygons, Drawing a Diagram to Solve a Problem, Circles

Assessments: Two Tests, Quizzes, Homework Assignments.

Area and Volume 2 Weeks

Key Concepts: Area: Parallelograms, Area: Triangles and Trapezoids, Area: Circles, Space Figures, Surface Area: Prisms and Cylinders, Surface Area: Pyramids – Cones - and Spheres, Volume: Prisms and Cylinders, Volume: Pyramids, Cones, and Spheres

Assessments: Two Tests, Quizzes, Homework Assignments.

Right Triangles in Algebra 2 Weeks

Key Concepts: Square Roots and Irrational Numbers, The Pythagorean Theorem, Distance and Midpoint Formulas, Special Right Triangles

Assessments: Two Tests, Quizzes, Homework Assignments.

Final Exam Review 1 Week

Key Concepts: Review Units 6-11

Assessments: Final Exam

NCTM Standards: Interpret representations of functions of two variables; approximate and interpret rates of change from graphical and numerical data; formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them; understand and use formulas for the area, surface area, and volume of geometric figures, including cones, spheres, and cylinders.

Biblical Integration: Galileo stated that “mathematics is the alphabet with which God wrote the universe.” Students will learn in this unit on geometry that mankind uses math to quantify God’s creation. By definition, geometry means to measure the earth. When measuring finite objects, such as prisms and cylinders, students will be challenged to recognize entities that can only be comparatively measured in light years, atomic mass units, etc.