Fundamentals of Geometry and Algebra - MS/ Part A

COURSE DESCRIPTION: Students enhance computational and problem-solving skills while learning topics in algebra, geometry, probability, and statistics. They solve expressions and equations in the context of perimeter, area, and volume problems while further developing computational skills with fractions and decimals. The study of plane and solid figures includes construction and transformations of figures. Also in the context of problem solving, students add, subtract, multiply, and divide positive and negative integers and solve problems involving ratios, proportions, and percents, including simple and compound interest, rates, discount, tax, and tip problems. They learn multiple representations for communicating information, such as graphs on the coordinate plane, statistical data and displays, as well as the results of probability and sampling experiments. They investigate patterns involving addition, multiplication, and exponents, and apply number theory and computation to mathematical puzzles.

COURSE OBJECTIVES:

- Apply ratio and rate reasoning to solve problems including unit pricing, constant speed, and work rate.
- Represent rational numbers with models, make order comparisons of rational numbers, and graph rational numbers.
- Perform operations of multiplication and division of rational numbers to solve perimeter and area problems.
- Write and solve one-variable addition and multiplication equations applying the equations to real world contexts including distance and area of geometric figures.
- Add and subtract signed numbers.
- Represent real-world quantities with signed numbers including financial applications.
- Describe data sets using measures of center and measures of variability.
- Find areas of polygons and surface areas of prisms and pyramids by decomposing the figures into figures with known areas.

PREREQUISITES: Successful completion of 5th grade math or equivalent.

COURSE LENGTH: Two Semesters

REQUIRED TEXT: No required textbook for this course.

MATERIALS LIST: No required materials for this course.

COURSE OUTLINE:

Module 1: Addition Equations

- Lesson 1: Foundations
- Lesson 2: On the Number Line
- Lesson 3: Order of Operations
- Lesson 4: Number Properties
- Lesson 5: Investigation 1
- Lesson 6: Convert between Words and Math
- Lesson 7: Estimation and Reasonableness
- Lesson 8: Investigation 2
- Lesson 9: Precision
- Lesson 10: Units of Distance
- Lesson 11: Investigation 3
- Lesson 12: Sum and Difference Equations
- Lesson 13: Investigation 4
- Lesson 14: Negative Numbers
- Lesson 15: Absolute Value and Distance
- Lesson 16: Solve Equations with Negatives
- Lesson 17: Module Review
- Lesson 18: Module Exam

Module 2: Multiplication Equations

- Lesson 1: Foundations
- Lesson 2: Information in Problems
- Lesson 3: Problem Solving Strategies
- Lesson 4: Investigation 5
- Lesson 5: Units of Area
- Lesson 6: Areas of Rectangles
- Lesson 7: Special Quadrilaterals
- Lesson 8: Area of Special Quadrilaterals
- Lesson 9: Investigation 6
- Lesson 10: Bases and Heights of Triangles
- Lesson 11: Areas of Triangles
- Lesson 12: Figures Made From Figures

- Lesson 13: Investigation 7
- Lesson 14: Unknown Side Lengths 1
- Lesson 15: Unknown Side Lengths 2
- Lesson 16: Investigation 8
- Lesson 17: Module Review
- Lesson 18: Module Exam

Module 3: Working with Rationals
- Lesson 1: Foundations
- Lesson 2: Equivalent Fractions
- Lesson 3: Investigation 9
- Lesson 4: Graphing Rational Numbers
- Lesson 5: Representing Rational Numbers
- Lesson 6: Converting Rational Numbers
- Lesson 7: Comparing Rational Numbers
- Lesson 8: Investigation 10
- Lesson 9: Perimeters with Fractions
- Lesson 10: Investigation 11
- Lesson 11: Areas with Fractions
- Lesson 12: Dividing Fractions
- Lesson 13: Visual Fraction Models
- Lesson 14: Fraction Division Problems
- Lesson 15: Investigation 12
- Lesson 16: Benchmark Fractions
- Lesson 17: Module Review
- Lesson 18: Module Exam

Module 4: Ratios and Rates
- Lesson 1: Foundations
- Lesson 2: Ratios as Comparisons
- Lesson 3: Rates as Comparisons
- Lesson 4: Percents
- Lesson 5: Discount
- Lesson 6: Tax and Tip

- Lesson 7: Investigation 13
- Lesson 8: Simple Interest
- Lesson 9: Investigation 14
- Lesson 10: Unit Rates
- Lesson 11: Solving Unit Rate Problems
- Lesson 12: Investigation 15
- Lesson 13: Average Speed Problems
- Lesson 14: Constant Rate Problems
- Lesson 15: Direct Variation
- Lesson 16: Investigation 16
- Lesson 17: Module Review
- Lesson 18: Module Exam

Module 5: Positives and Negatives

- Lesson 1: Foundations
- Lesson 2: Adding Signed Numbers
- Lesson 3: Net Gains and Losses
- Lesson 4: Bank Accounts
- Lesson 5: Investigation 17
- Lesson 6: Multiplying Signed Numbers
- Lesson 7: Credit
- Lesson 8: Investigation 18
- Lesson 9: Dividing Signed Numbers
- Lesson 10: Properties of Signed Numbers
- Lesson 11: Funding College
- Lesson 12: Career
- Lesson 13: Investigation 19
- Lesson 14: Inequalities
- Lesson 15: Investigation 20
- Lesson 16: Module Review
- Lesson 17: Module Exam
- Lesson 18: Portfolio

Course Asset Credits