**#936 MATH 10 SMALL GROUP**

**GRADE:** 10

**LEVEL:** Small Group

**CREDITS**: 10

**PREREQUISITE**:Individualized Educational Plan with this component

**BASIC TEXT:** Algebra, Prentice Hall
Informal Geometry, Prentice Hall, 1992

**SUPPLEMENTAL READINGS:** None

**REQUIRED MATERIALS:** notebook, pencil, calculator, agenda book

**COURSE DESCRIPTION:**
Students in this Mathematics course are provided with small group instruction which addresses the concepts and factual information in a manner consistent with his/her identified special needs. This course is intended for students still experiencing some algebra difficulties. A comprehensive review of solving algebraic equations is included. It is especially designed for those students who have problems with geometric concepts. Angles, lines, triangles, quadrilaterals, other polygons, circles, transformations, and area and volume of 2-and 3-dimensional figures are studied through more discovery learning situations.

**MISSION RELATED GOALS:**
This class will provide the student with a variety of opportunities to demonstrate academic excellence and intellectual curiosity by communicating effectively, solving complex problems, and working with others toward a common goal.

**STUDENT EXPECTATIONS FOR LEARNING ADDRESSED:**
Students will be afforded opportunities to apply mathematical concepts to real-world applications. A variety of teaching methods will be used to foster an environment that promotes self-confidence and respect for others throughout the school and global community.

**GENERAL PERFORMANCE OBJECTIVES:**
The student will be able to:
1. Identify, classify, and measure different types of geometric figures
2. Identify and apply the definitions, theorems and postulates related to parallel lines, skew lines, parallel planes, transversals and the angles formed by them
3. Understand the relationship of angles and sides in triangles and other polygons
4. Apply the properties of special triangles, e.g. isosceles, equilateral, and right triangles
5. Apply the properties of all quadrilaterals
6. Apply the properties of similar polygons
7. Apply the formulas for perimeter, circumference, area, and volume of geometric figures
8. Apply algebraic skills in preparation for MCAS exams

**MASSACHUSETTS FRAMEWORKS STRANDS:**

- Number sense and Operations
- Patterns, Relations and Algebra
- Geometry
- Measurement

**CURRICULUM FRAMEWORK LEARNINE STANDARDS:**

I. Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties. (10.N.1)

II. Simplify numerical expressions, including those involving positive integer exponents or the absolute value and apply such simplifications in the solution of problems. (10.N.2)

III. Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator. (10.N.3)

IV. Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope. (10.P.2)

V. Add, subtract, and multiply polynomials. Divide polynomials by monomials. (10.P.3)

VI. Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms; factoring; identifying and canceling common factors in rational expressions; and applying the properties of positive integer exponents. (10.P.4)

VII. Solve equations and inequalities including those involving absolute value of linear expressions and apply to the solution of problems. (10.P.6)

VIII. Identify figures using properties of sides, angles and diagonals. Identify the types of symmetry. (10.G.1)

IX. Draw congruent and similar figures using compass, straightedge, and protractor. (10.G.2)

X. Recognize and solve problems involving angles formed by transversals of coplanar lines. Identify and determine the measure of central and inscribed angles and their associated minor and major arcs. (10.G.3)

XI. Apply congruence and similarity correspondences and properties of the figures to find missing parts of geometric figures. (10.G.4)

XII. Solve simple triangle problems using the triangle-angle sum theorem and/or the Pythagorean theorem. (10.G.5)

XIII. Use properties of special triangles to solve problems. (10.G.6)

XIV. Using rectangular coordinates, calculate midpoints of segments, slopes of lines and segments, and distances between two points and apply the results to solutions of problems. (10.G.7)

XV. Draw the results and interpret transformations of figures in the coordinate plane. (10.G.9)

XVI. Calculate perimeter, circumference and area of common geometric figures. (10.M.1)

XVII. Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, cylinders, and cones. (10.M.2)

XVIII. Relate changes in measurement of one attribute of an object to changes in other attributes. (10.M.3)

**UNITS AND THEMES:**

| | | |
|---|---|---|
| I. | Basic Terms and Initial Properties (20 days) | 10.G.1, 10.G.2, 10.P.6 |
| II. | Parallel Lines and Angles about a Point (15 days) | 10.G.3, 10.G.5 |
| III. | Isosceles Triangles and Special Segments (10 days) | 10.G.2, 10.G.6 |
| IV. | Polygons (10 days) | 10.G.1 |
| V. | Quadrilaterals (15 days) | 10.G.1, 10.G.3, 10.P.6 |
| VI. | Coordinate Geometry (10 days) | 10.G.7, 10.P.2 |
| VII. | Similar Polygons (10 days) | 10.G.4, 10.P.6 |
| VIII. | Circles (12 days) | 10.G.3, 10.M.1 |
| IX. | Area and Volume (15 days) | 10.M.1, 10.M.2, 10.M.3 |
| X. | Transformations (16 days) | 10.G.9 |
| XI. | MCAS Review (10 days) | 10.N.1, 10.N.2, 10.P.3, i. 10.P.4, 10.P.6 |
| XII. | Right Triangles (15 days) | 10.G.5, 10.G.6, 10.N.3 |
| XIII. | Congruent Triangles (10 days) | 10.G.4 |
| XIV. | Review for Midterm and Final (8 days) | |
| XV. | Miscellaneous (4 days) | |

**COURSE OUTLINE:**

**I. Basic Terms and Initial Properties** 10.G.1, 10.G.2, 10.P.6

A. Basic geometric terms
B. Constructions
C. Measuring segments
D. Angles
E. Perpendicular lines
F. Review of algebraic concepts used to solve equations

**II. Parallel Lines and Angles about a Point** 10.G.3, 10.G.5

A. Parallel lines
B. Angle measure in triangles
C. Solving algebraic equations
D. Applications

**III. Isosceles Triangles and Special Segments** 10.G.2, 10.G.6

A. Isosceles triangles
B. Altitudes
C. Medians
D. Angle bisectors

**IV. Polygons** 10.G.1

A. Identification
B. Properties
C. Interior and exterior angles

**V. Quadrilaterals** 10.G.1, 10.G.3, 10.P.6

A. Properties, classification
B. Trapezoids
C. Parallelograms
D. Applications

**VI. Coordinate Geometry** 10.G.7, 10.P.2

A. Review of the coordinate plane
B. Review of slope
C. Distance formula
D. Midpoint formula
E. Applications

**VII. Similar Polygons** 10.G.4, 10.P.6

A. Ratio
B. Proportion
C. Applications

**VIII. Circles** 10.G.3, 10.M.1

A. Definitions
B. Perimeter
C. Area
D. Applications

**IX. Area and Volume** 10.M.1, 10.M.2, 10.M.3

A. Formulas
B. Ratios for similar polygons
C. Applications

**X. Transformations** 10.G.9

A. Reflections
B. Translations
C. Rotations

**XI. MCAS Review** 10.N.1, 10.N.2, 10.P.3, 10.P.4, 10.P.6

A. Practice with open-ended questions
B. Test strategies
C. Practice sample tests

**XII. Right Triangles** 10.G.5, 10.G.6, 10.N.3

A. Review of square roots
B. Pythagorean Theorem
C. Applications

**XIII. Congruent Triangles** 10.G.4

A. Definition of congruent polygons
B. Corresponding parts of congruent triangles

**XIV. Review for Midterm and Final**

**XV. Miscellaneous**

**SUGGESTED INSTRUCTIONAL STRATEGIES:**

1. Lecture
2. Directed investigation
3. Group Work
4. Projects
5. Use of Manipulatives
6. Use of a Variety of Questioning Techniques
7. Board Work/homework
8. Calculator Activities
9. Drill and practice with in class teacher/intern support
10. As specified by Individual Educational Plan

**SUGGESTED INTERGRATED ACTIVITIES:**

1. Pizza Week (applications using circle formulas)
2. M&M project
3. Create a Board Game
4. Polygon Posters
5. Translation, Reflection, Symmetry Projects

**USE OF TOOLS/TECHNOLOGY**

1. Use of calculator
2. Use of overhead projector with transparencies
3. View video selections
4. Use of Geometric instruments

**ASSESSMENT TECHNIQUES:**

1. Students will take free-response performance tests
2. Students will participate in classroom discussions and demonstrate problem solving on the chalkboard and overhead projector
3. Students will work in cooperative situations and report their results
4. Students will do directed investigations, take notes, correct quizzes and tests and save sample work in a notebook which will be graded.