

Purpose

This course which contains little review of the basic concepts of Algebra I is designed for the above average college-prep student who has shown an obvious proficiency in previous math courses.

Geometry holds an important role in high school mathematics, primarily through its focus on deductive reasoning. In addition, geometry helps us represent and describe the world in which we live; it includes categorizations and properties of shapes and their relationships. Developing skills in deductive reasoning, learning how to construct proofs, and understanding geometric properties are important outcomes of the high school geometry course. Equally important, however, is the continued development of visualization skills, pictorial representations, and applications of geometric ideas to describe and answer questions about natural, physical, and social phenomena.

Deductive reasoning is highly dependent upon communication skills. In fact, mathematics can be considered as a language, a language of patterns. Communication and language play a critical role in helping students to construct links between their informal, intuitive geometric notions and the more abstract language and symbolism of high school geometry.

I. New Jersey Core Curriculum Standards for Mathematics

- 4.1 Number and Numerical Operations
- 4.2 Geometry and Measurement
- 4.3 Patterns and Algebra
- 4.4 Data Analysis, Probability, and Discrete Mathematics
- 4.5 Mathematical Processes

II. Content Clusters

- Unit 1 - Points, Lines and Planes
- Unit 2 - Triangles
- Unit 3 - Figures in the Plane
- Unit 4 - Circles and Measurement

III. Student Outcomes**Unit I - Points, Lines and Planes (4.1 A; 4.2 A,C; 4.3 A,B,D)**

Students will be able to:

1. Identify and name figures such as points, lines, planes, rays.
2. To measure line segments and compare lengths and identify congruent segments.
3. To use the distance formula and midpoint formula.
4. To classify angles and polygons.
5. To identify important angles such as complementary and supplementary angles.
6. To focus on reasoning in geometry.
7. To compare and contrast inductive and deductive reasoning and the importance of counterexamples in disproving statements.
8. To analyze conditional statements, learning to identify the hypothesis and conclusion of a statement and write the converse, inverse and contrapositive.
9. To reason postulates and theorems for geometry.
10. To focus on reasoning on parallel and perpendicular lines.
11. To identify corresponding angles, consecutive interior angles, alternate interior angles, and alternate exterior angles.
12. To use postulates about parallel lines intersected by a transversal.
13. To prove lines are parallel.

14. To find slopes of parallel and perpendicular lines.
15. To write and graph equations of a lines.

Unit 2 – Triangles (4.2 A, B, C, E)

Students will be able to:

1. Write congruence statements for triangles and other geometric figures.
2. Utilize key postulates and theorems to prove that triangles are congruent.
3. Use corresponding parts of congruent triangles to write proofs.
4. Classify triangles as equilateral and isosceles.
5. Use properties of midsegments to solve problems.
6. Identify the properties of perpendicular bisectors, medians, and altitudes of triangles, along with using these properties to justify statements and solve problems.
7. Apply relationships among the angles and sides of a triangle or triangles, including the Triangle Inequality Theorem.
8. Use indirect proofs to prove properties and relationships by contradiction.
9. Write and solve proportions, including solving problems involving the geometric mean.
10. Write proofs and solve problems involving indirect measurement problems, using postulates and theorems about similar triangles.
11. Utilize proportionality theorems to justify their reasoning and solve problems.

Unit 3- Figures in the Plane (4.2 A,B,C,E)

Students will be able to:

1. Use techniques of indirect measurement to represent and solve problems: Pythagorean Theorem
2. Use techniques of indirect measurement to represent and solve problems: Similar triangles
3. Use techniques of indirect measurement to represent and solve problems: Right triangle trigonometry (sine, cosine, tangent)
4. Use coordinate geometry to represent and verify properties of lines: Midpoint and slope of a line segment
5. Apply the properties of geometric shapes: Minimal conditions for a shape to be a special quadrilateral
6. Determine, describe, and draw the effect of a transformation, or a sequence of transformations, on a geometric or algebraic object, and, conversely, determine whether and how one object can be transformed to another by a transformation or a sequence of transformations

Unit 4 – Circles and Measurement (4.2 A, E; 4.4 B)

Students will be able to: 1. Apply the properties of geometric shapes: Circles-arcs, central and inscribed angles, chords, tangents

1. Use concepts and formulas of area to calculate geometric probabilities
2. Use a variety of strategies to determine perimeter and area of plane figures and surface area and volume of 3D figures: Estimation of area, perimeter, volume and surface area.

IV. Materials

A. Text: McDougal Littell Geometry- New Jersey Edition OO'

Additional materials will be supplement when necessary

B. Notebook, paper, pencil, and eraser must be provided by the

Student. Calculators will be provided when necessary. Students may purchase their own Personal calculator as research supports the fact that the more familiar they are with the calculator, the better their performance.

V. Evaluation

- A. The student will be expected to complete classwork, homework, keep a notebook and take tests and quizzes. These will be checked and reviewed by the teacher.
- B. The student will be expected to demonstrate an acceptable level of proficiency in the objectives and content of this course.
- C. The student will be expected to demonstrate at all times appropriate classroom behavior such as self-control, respect for others, respect for property and a mature attitude.
- D. The student will be expected to adhere to the school rules and regulations for behavior and the district policy for attendance.
- E. Students will be required to successfully pass the High School Proficiency Test as mandated in the graduation law (N.J.S.A. 6:8-4.2).
- F. Students who fail the HSPA examination will be placed in a Basic Skills Math class as required by N.J.S.A. 6:8-4.2. There will be no exceptions to this requirement.
- G. The student will be expected to take a comprehensive final exam covering the entire school year's work. This exam will count at 1/5 of the final grade.
- H. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.

Teachers in every discipline will include opportunities wherein students will reinforce writing skills through homework assignments, class work activities, and special assignments / projects /reports if required, by writing in complete sentences, using correct spelling and punctuation.

Reviewed and Revised July 2008

Reviewed August 2010

Reviewed August 2011

Reviewed and revised: August 2010